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SYLLABUS

Unit I	:	Financial Management - Nature, Objectives and functions - Scope of financial management - Importance of time value of, money in financial decisions - sources of finance.
Unit II	:	Financial Statement Analysis and Ratio Analysis -Income and Position Statement - Meaning and Objectives of Ratio Analysis - Types of Ratio -Uses and Limitations.
Unit III	:	Fund Flow and Cash Flow Analysis
Unit IV	:	Marginal Costing - Cost Volume Profit Analysis -Break even Analysis. Multi-product Situation -Differential Cost in Alternative Choice Decision.
Unit V	:	Budgeting and Budgeting Control - Classification of Budget -Sales Budget - Production Budget - Selling and Distribution Cost Budget - Labour Budget-Plant Utilisation Budget - Production Overhead Budget -Cash Budget -Master Budget - Flexible Budget and Zero - base Budget, Budgetary Control- Definition-Objectives -Essentials.
Unit VI	:	Financial Decisions - Cost of Capital - Meaning and Measurement - Capital Budgeting Techniques - Techniques of Appraisal of Investment Proposal
Unit VII	:	Working Capital Management-Concept of Working Capital - Deployment of Working Capital -Source of Working Capital - Analysis of working Capital - Cash, Receivable and Inventory Management. Working Capital Forecasting -Credit Management.
Unit VIII	:	Capital Structure -Introduction -Capital Structure Theories - Assumptions - Definition of Net Income Approach - Net Operating Income Approach - Modigliani - Miller Approach - Traditional Approach.
Unit IX	:	Operating, Financial and Combined Leverage.; Operating Leverage -Financial Leverage EBIT- EPS Analysis -Indifference Point - Combined Leverage.
Unit X	:	Dividend Policy - Introduction -Determinants of Dividend Policy - Dividend Pay Out Ratio -Stability of Dividend -Legal, Contractual and Internal Constraints and Restrictions - Irrelevance of Dividend - MM Hypothesis - Assumptions -Relevance of Dividends - Walter's Model, Gordon's Model.

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UNIT 5 BUDGETING AND BUDGETARY CONTROL

Structure

5.0 Introduction
5.1 Unit Objectives
5.2 Meaning and Definitions
5.3 Functional Budgets
5.4 Key Terms
5.5 Summary
5.6 Answers to check your progress
5.7 Questions / Exercises

5.0 INTRODUCTION

It is a common practice that everyone in his day-to-day life prepares and uses a budget of one or another. An individual will estimate what he is likely to earn in the coming months and plan his expenditure on food, rent, bus charges, etc. In order to be able to control his expenditure, it is normally necessary for him to set limits on how much he will spend on individual items. The housewife will budget even for a short- period, usually a week. When the actual expenditure is incurred, a comparison can be made with the budgeted estimates to find out whether the actual expenditure exceeds or is less than the estimate. A business will prepare a budget for a similar purpose but it will be more detailed so that control can be exercised over all aspects of the enterprise.

5.1 UNIT OBJECTIVES

- Understand the objectives and importance of budgeting and budgetary control.
- Understand the advantages and disadvantages of budgetary control.
- Differentiate between various types of budgets.
- Understand the process of preparation of budgets.

5.2 MEANING AND DEFINITIONS

Budget

From the above description, we can understand that a budget is a plan of future activities normally expressed in financial terms. Budgeting involves analyzing the post performance, forecasting the future events during the budget

period and fixing the targets. It is not a more 'forecast' or a 'prediction' or a 'guestimate' or 'estimate' but a well conceived plan which shows the desired level of profitability of the company as a whole.

A forecast is just the statement of events that are likely to occur; but a budget is a target. The former is concerned with 'Probable events' the latter relates to 'Planned events' and is a statement' of the policy to be carried out. According to the Institute of Cost and Works Accountants (United Kingdom) a budget is a financial and / or quantitative statement, prepared and approved prior to a defined period of time, of the policy to be pursued during that period for the purpose of attaining a given objective". In short, the budget can be defined as "a predetermined statement of management policy during a given period which provides a statement for the comparison with the results actually achieved".

Budgetary Control

Budgetary control is the process of planning and coordinating all functions to achieve harmony and to control performances and costs. It establishes the responsibility, through the corporate structure, of all managers for achieving the company's budgeted objectives. It entails measuring at suitable intervals how the plan is actually progressing and if divergences are occurring ,taking necessary corrective actions to ensure that the company gets back on course again. Quoting the Institute of Cost and Works Accountants budgetary control is "the establishment of department budgets relating to the responsibilities of executive to the requirements of a policy, and the continuous comparison of actual with budgeted results either to secure, by individual action or through executive direction, the objective of that policy or to provide a basis for its revision". A study of this definition would show that budgetary control system involves:

1) The establishment of targets
2) The comparison of actuals with the target and
3) Acting upon results to achieve maximum profitability.

Budgetary control involves two functions.

1) Making Budgets for future activities.
2) Using these budgets to control activities.

In other words, the concept of budgetary control concerns itself with planning, organizing and controlling, all the financial and operating activities of the organization in the forthcoming period.

Planning – Budgetary control begins with preparation of a detailed quantitative plan of action.

Organising – The plan, in turn, provides a motive and guide to action for all responsible managers in all segments of the concern.

Controlling – When the results of actual performance become available, they are tabulated and compared with the plan for purposes of highlighting off-standard performance as a basis for instituting corrective action.

Dr. Paula has illustrated the main idea of Budgetary control through an analogy. The position may be likened to the navigation of a ship across the seas. The log is kept written recording every thing happening and position of the ship from hour t o hour, and valuable lessons are to be learnt by the captain from a study of the factors that coused the misadventures of the past. But to navigate his ship safely over the seas, the captain requires his navigating officer to work out the course ahead and constantly to check his ship's position against the predetermined one. If the ship is off its course the navigation officer must report immediately, so that the captain may take prompt action to regain his correct course.

Exactly so is the case with industrial ship, the past records represent the log and the auditor is responsible for verifying, so far as he can, that those records are correct and reveal a true and fair view of the financial position of the concern. But, what modern management requires., is a forecast showing in detail_anticipated course of business for (say) the coming year. During the course of the year a management requires immediate reports of any material variance from the predetermined course, together with explanation of the reason.

Some other important definitions given by various authorities are reproduced below:

1) 'Budgetary control may be described as a process of finding out what's being

done and comparing actual results with the corresponding budget data in order to Approve accomplishments or to remedy differences by either adjusting the budget estimates or correcting the differences".

-George R. Terry

2) "Budgetary control involves the use of budgets and budgetary reports throughout the period to co-ordinate, evaluate and control day-to-day operations in accordance with goals specified by the budget"

-Glenn A.Welsch

The objectives of Budgetary Control

The main objectives of budgetary control are;

1) To plan the allocation of business resources, so as to achieve maximum Profitability.
2) To communicate plans and targets to executives responsible for their execution.
3) To bring about co-ordination between the activities of the business.
4) To motivate executives to achieve targets.
5) To provide a yard stick for comparison with targets.
6) To show managements where action is needed to remedy a situation.
7) To centralise control.
8) To decentralize responsibility on to each executive involved.
9) To combine the ideas and aspirations of all levels of management.
10) To act as a guide and director during unforeseen contingencies.

The above objectives are not mutually exclusive, rather they overlap, for example, when the planning function is performed, the basis for effective co-ordination has been laid. It is impossible to obtain effective co-ordination and control without effective planning. Co-ordination is impossible without effective control and effective control results in effective co-ordination.

Zero Based Budgeting

The system is prevalent in U.S.A. Under this system budget estimates for the future periods are made from the zero level whereas under the prevalent system budget estimates are based on the past year's performance.

Advantages of Budgetary Control

1. Instruments of planning

Business budgets are the principal financial instruments by which the management can formalize and express its plan in terms of quantity and costs. Budgeting helps the process of planning by reducing it to concrete goals. Hence, Koontz and O'Donnell define budgeting as "The formulations of plans for a given future period in numerical terms. As such, budgets are statements of anticipated results in financial terms as in revenue and expense and capital budgets are in non-financial terms as in budgets of direct labour – hours, materials, physical sales volume, of units of production. It is sometimes said, for example, that financial budget represents the "dollarizing of plans". This statement clearly reveals the fact that a budget each year's operations are planned with the previous results in mind and yet with an eye on the future. As a result problems are often anticipated in advance and solved before they actually arise if a good budget is in practice, the very process requires management to plan ahead and carefully analyse future needs.. This advance planning is looked upon with favor by credit agencies as indicative of sound management.

2. Tool of co-ordination

The budget serves as a tool through which the functions of various departments and divisions are co-ordinated. To prepare a badget it is necessary for all sections of the business to co-operate and to be aware of other section's strengths and limitations as well as their own. This co-ordenation provides for smoother operation and less internal friction which results in the achievement of the budget goal.

3.Delegation of authority and responsibility

Budgetary control paves the way for the management to delegate authority and responsibility without sacrificing overall control. By giving executives at lower

levels the authority and responsibility of routine operations, it enables the manager to take decisions on many vital issues and provides opportunities for the unfolding of their capacities and talents.

4. A checking tool

Measurement of performances productions and sales quotas and other targets are achieved automatically as part of the system. As a control device, it involves comparison of actual results with the budgets. The differences. If any , between a budget figure and an actual figure is called a 'budget variance'. Study of significant variances from the budgeted results enables corrective action to be taken so that progress or lack of progress towards the objectives may be checked. This prevents 'buck passing' when the budget figure are not achieved. But co-ordination of efforts cannot take place automatically, individual differences and prejudices prevent. Left to themselves, individuals tend to go in different directions, each one honestly believing that he is acting in the best interest of the organization. Looking only at sales volume, the sales department may stage an extensive promotional campaign and increase its selling capacity of the production department \; in an attempt to utilize available capacity of the full, the production department may manufacture more than the sales division can sell. In some cases individual interests are in conflict. The production man thinks in terms of quality; the salesman thinks in terms of price. The purchasing department is tempted to buy in large quantities to take advantage of low prices; the production department is concerned with inventory levels; the treasury is worried about the invoices, which must be paid. These differences can easily be reconciled for the good of the whole organization by a well-knitted budgetary control system.

5. Control of costs

Cost consciousness is increased and there is introduced an attitude of mind in which wastes and inefficiency cannot thrive. Budgeting enters into cost control at three points.

1. When the budget is being prepared, departments submit the cost figures for their

   Functions.

2. After they have been reviewed and approved, departmental requests become budget

   Costs that set desirable limits on spendings.

3. At the end of the budget period, a comparison of actual expenditures with budget costs is made as a means of judging performances and fixing responsibility for deviations.

Operating efficiency may be reflected in lower cost of production. But the budgeting should not be associated with cost reduction. Although cost reduction is certainly one of the objectives of budgeting there are times when higher spending is called for to encourage improvement in certain areas. The aim of budgeting is not to determine how little can be paid out but how much should be spent to achieve a desired goal.

6. Accounting records

To prepare the actual figures it is necessary to have a sound system of recording information; the information obtained from such records can be utilized as yardsticks to measure efficiency for various parts of the organization.

7. Controlling the income and expenditure

Micowber says.–Annual income twenty pounds, annual expenditure nineteen pounds, result is happiness; annual income twenty pounds annual expenditure twenty pounds and six shillings, result is misery. To bring 'happiness and avoid misery', budgeting provides a means of controlling in detail the income and expenditure of a business:

Budgetary control paves way for the most effective uses of productive resources employed in the business. Financial resources world be used most advantageously as costs are kept to minimum and performance is to be continuously improved. Therefore, budgetary control is no longer regarded as a luxury. It is absolutely essential in the complex conditions of modern business.

8) Budgetary control also acts as an impersonal policeman and brings efficiency and economy to the firm. Moreover it gives a target to the management to shoot at rather than plunge in the dark.

9) It guards the firm from such managers who most of the time think of extra ambitious plans.

10) By means of centralization of budgetary control uniformity is brought about.

11) Budgeting also helps to forecast the possible effect of various decisions.

12) It prepares the basic ground for the adoption of standard costing and other cost Techniques.

13) It facilitates the participation of all in planning thus it provides better motivation for achievement of the targets.

14) Budgetary control also acts as a feed back for revision and altering the future plans of actions.

Limitations of Budgetary Control

1. Future is uncertain

Estimates and forecasts relating to the future can never be perfectly accurate for the simple reason that the future is always uncertain. If the budgeted figures are hopelessly inaccurate, then the whole system concerned is likely to be of very limited value. Only by experience the management can draw a better budgetary programme. If may take several years to attain a reasonably good budgetary programme and management must not expect too much during this development period.

2. Inflexible nature

Perhaps inflexibility is the greatest danger in budgetary control. Forecasts once made normally become irrevocable. Even if budgetary control is limited to major items and is not used to suppliant management, the reduction of plans to numerical terms gives them a king of illusive definiteness. If may be proved that a larger amount for another or that sales will exceed or fail materially below the budgeted control system is so detailed that they become cumbersome and unduly expensive.

3. A costly system

The cost of installing and operating a budgetary control system is often quite high and small-scale houses cannot afford it. Thus, this system can be followed only by large organizations. Even in some large enterprises budgetary control system is so detailed that they become cumbersome and unduly expensive.

4. Not a substitute for management

A budget is a tool of management and not substitute for it, Budgetary control does not replace sound management. Those who rely merely on the budget generally neglect the other important factors like common sense, individual judgement, executive, manipulation of resources etc. Possibly this is to some extent due to lack of understanding on the part of the staff about the

purpose of budgetarycontrol.Hence the Scope and limitations should be explained before the system is brought into operation.

5. A lot of paper work

A lot of paper work will be involved in the operation of budgetary control. The complacency of paper work may lead to the eventuality that little notice or action is taken.

6. Lack of co-ordination

The basic requirement for the success of budgeting is the absolute co-ordination between various departments; this is often lacking in many organizations

7. Responsibilities may overlap

The best budgeting is one which puts the appropriate responsibilities squarely on the shoulders of the "concerned" person. But it is not so simple. Many times there is overlapping of duties. Budgetary control has to overcome this difficulty.

8. Resistance to change

Another difficulty with regard to budgeting is the attitude of ole and well established people who may not like to pursue the dynamic approach of the management as regards budgetary control.

A survey, conducted by the National Industrial Conference Board of New York, of some 300 representative American manufacturing firms revealed the various reasons for the failure of the budgetary control system. Important among them are:

1) Too much of expectation

2) Poor organization

3) Inadequate accounting system

4) Failure to obtain co-operation

5) Failure to analyse and ascertain causes of variances

6) Failure to revise the estimate i.e., lack of flexibility

The above limitations should not frighten anybody but these should be kept in view while preparing the budgetary programme. When the necessary safeguards to eliminate these limitations have been arranged, there is no doubt that the organization can reap the advantages of budgetary control system.

Organisation for Budgetary Control

For a budgetary system to be effective, it is necessary to have a sound organizational structure. A number of preliminary steps have to be taken to engineer confidence in the minds of the staff. Such preliminaries include the following.

1) Creation of Budget Centres

A budget centre is the area controlled by an individual. The Institute of Cost and Managements Accountants (U.K.) defines a budget centre as:

"A section of the organization of the undertaking defined for the purposes of budgetary control"

Such budget centres should be created for proper functioning of budgetary control system.

Departments may be budget centres. Moreover, the areas selected should comply with the usual responsibilities of supervisors and executives. Fo. example, transport department may function as a budget centre. The manager of the head of this department will have to act as the manager of particular budget centre. Thus, each centre will have a manager or centre head who will be responsible not only for the preparation of the budget but also for the actual results as compared with the budget targets. A budget thus prepared for a particular budget centre is known as a department budgement.

Within the budget centre (for instance, the transport department) there may be other smaller areas to which costs are attributable. This smaller area is called "a cost centre".

The institute of Cost and Management Accountants defines a cost centre as:

"A location, person or item of equipment or in, for a group of these which costs

May be easily and conveniently ascertained and used for purposes of cost control"

The whole idea behind this arrangement is to recognize the fact that costs are best controlled at the point where they are incurred.

2) Good Accounting system

An organization which adopts budgetary control system must generally have a fairly sophisticated accounting system to generate and disseminate timely

information. A chart of accounts should be maintained which corresponds with the budget centres.

3) Better knowledge about the system

Every person who is involved in the system should be kept informed what a budget is; what it hopes to accomplish and what place he occupies in the plan. The whole system should enjoy the support and co-operation of all concerned.

4) Organisation chart

The organization chart would obviously depend upon the nature and size of the business undertaking. This defines the functional responsibility of each member of management and ensures that he knows his position in the organization and his relationship to other member.

5) Establishment of a Budget Committee

In a small concern the budget may be prepared by the accountant himself but in a large concern a budget committee is often established which exercises the ultimate control over the budgeting procedures. A budget committee is normally consisting of chief executive, budget officer and heads of the main departments. The committee will usually be chaired by the chief executive (e.g. General Manager). The Budget officer (or the Budget controller or Budget Director may be the Secretary of the Committee. Thiscommittee will set the general guidelines that the organization is to follow, co-ordinate the separate budgets prepared by the various organizational units, resolve defferences among them and submit the final budget to the President and to the Board of Directors.

Once the Board of Directors has set the policy, it is the duty of the Budget committee to put the policy into practical terms and ensure that they are being carried out. The main functions of the committee to attain this goal are:

1. To give guidelines in accordance with the general policy of the management..
2. To disseminate instructions about the mechanics of budget preparations.
3. To provide data on past performance that are useful in the preparation of the budget.
4. To receive and review individual departmental budgets.

5. To suggest revisions for removal of inconsistencies with the overall objective of the enterprise.

6. To approve the budget in its final form,

7. To prepare the master budget after departmental budgets are approved.

8. To revice and consider budget reports showing actual results compared with the budget and to value the nature of action proposed to be taken in case of significant deviation and recommend specific line of action for the same.

9. To revise the targets, if necessary.

10. To co-ordinate the budgets programme.

11. To get feed back information about the corrective actions.

6. Preparation of Budget Manual

Institute of Cost and Managemer Accountants (ICMA) (U.K.) has defines Budget Manual as "document which sets out the responsibilities of the persons engaged in the routine of and the forms and record s required for budgetary control". It is essential that the objectives, requirements and process of budgeting are clearly understood by all personnel involved in the budgeting programme. Moreover, there should not be any ambiguity about what is required of each individual in relation to budgets. For this purpose an booklet known as the "budget manual" is prepared for the use of all the persons concerned. It is usually in loose leaf form which facilitates division in to sections and easy distribution of appropriate section to the executives requiring them. Alternations, if any, can also be made in this loose-leaf type of manual.

A brief explanation of purpose and principles of budgetary control.

1) Definition of lines of authority and responsibility.
2) Description of duties of various personnel in preparing the budget.
3) Time scheduled for budget preparation.
4) Forms of schedules.
5) Procedures for obtaining approval.
6) From and nature of report
7) Procedures of Budgetary control.

7) Budget period

The budget period is the period for which budget are prepared. There is no general rule governing the selection of a period of time for a budget. This will be determined by the particular circumstances of the business. For instance, the fashion industry must, because of necessity, have a very shout budget period, sometimes of three or four month's duration whereas in the electricity industry, it may range over nine or tem years. Long-term budgets provide perspective since one would be able to have a view of what is likely to be achieved in a course of years and what the chief problems are likely to be. But due to long period, long term budgeting may be considerable affected by unforeseen conditions. Short-term budgets may be quite exact and detailed but it is usually costly to prepare and operate with.

For most businesses one year is normally the accepted period. These yearly budgets are broken down into quarterly or even monthly periods.

Another common practice prevailing among the business houses is to maintain both long-term budget and short-term budget; long-term budget for planning ahead for five to ten years and short-term budget to control the day-to-day running of the business.

For control purposes, the budget period may be divided into shorter periods, say a calendar month. This period is called "control period". This control period indicates the period on the expiry of which the regular reports have to be sent to the appropriate superiors.

8) Determination of the "KEY FACTOR 'OR' LIMITING FACTOR"

The 'key factor' is the factor which prevents an enterprise from earning profits indefinitely. The constraint may take any from such as market for the product, supply of raw materials etc. The extent of its influence must be fully assessed in order to ensure that the Functional of Departmental budgets are realistic. Normally, the whole budget involving all functions may have to be built around this key factor. The key factor (often known as the "Limiting "or" principal factor" or "governing" factor) is of vital importance when the budget is being prepared. It may not be the same factor for each budget period as circumstances may change.

Check your progress

1. State True or False

a) Budget Preparation is a planning function

b) Budget any control starts with budget and end with control

c) Budget manual is the master budget

d) Master budget is also a functional budget

e) Cash budget is prepared is the beginning of all other budget.

Some examples of key factors are the fallowing:

1) Production capacity
2) Low market demand
3) Limited amount of capital
4) Shortage of material
5) Shortage of key personnel
6) Shortage of space
7) Lack of 'know – how'
8) Lack of transport and distribution net work.

The tow vital factors are production capacity and market demand. Suppose, if the production capacity is 10,000 units and it cannot be increased in the short run, Budgets (for example sales budget and raw materials purchase budget) will have to be based on production of 10,000 units. On the other hand, if the market demand is only for 5,000 units and it cannot be pushed up in the short-run, all budgets say, production budget, will have to be based on the sales of 5,000 units. It is now obvious that to attain maximum profits as far as possible a key factor must be got over. It is also true that if one key factor is got over another may crop up.

9) Laying down 'Level of activity'

It is essential to establish the normal level of activity i.e. level of performance the company can reasonably be expected to achieve. This level of activity is portent in planning production (for material and labour requirements as well as production overheads which are to be covered on machine-hour rates). The level of activity will be decided by the management taking into consideration the prospects of improving the net profitability of a product.

Flexible budgetary control

Budget may be discussed under two broad classifications:

(1) Fixed Budget and (2) Flexible Budget.

According to Institute of cost and Management Accountants (U.K.) a fixed budget is "a budget which is designed to remain unchanged irrespective of the level of activity actually attained".

Fixed budget is prepared for the defined level of activity in quantitative as well as financial terms. To illustrate 'A typical fixed budget is a plan tailored to a single target volume level of say 50,000 units. All results would be compared with the original plan regardless of changes in conditions (for example), volume of production may turn out to be 40,000 units instead of the budget target of 50,000 units). Hence, this type of budget is prepared by enterprise whose quantity of production or sales during the budget period can be predetermined with reasonable accuracy.

A flexible budget, as its name itself implies is a budget which is designed to amend the budget figures as the level of output changes I.C.M.A defines flexible budget as "a budget which is designed to change in accordance with the level of activity attained' It is based on the assumption that many types of business have great difficulty in estimating the actual volume of activity with any accuracy because of external influences. A flexible budget is prepared for a range of activities instead of single level and it supplies a dynamic basis for comparison. The flexible budget approach says, "Give me any activity level you choose and I will provide a budget tailored to that particular volume"

It is obvious that the comparison of budget figures with actual results in the kernel point of budgetary control.

In fixed budgetary control the figures are prepared on the basis of an estimated volume of output. If the actual volume of output differs considerably from the budgeted one a meaningful comparison can be made only if budget figures are adjusted for changes in the volume of output. In other words, the objective of flexible budgetary control is to change the budget figures progressively to correspond with the actual output achieved.

The are three methods for developing flexible budget (A) Multi-activity method (B) Formula method and (C)Graphic method.

A. Multi-Activity method

Under this method a flexible budget is prepared for varying levels of output. It is probable that thougn it relates to sales, cash etc., it is essentially a production cost budged. The budget has to be changed to correspond with the actual volume of production. If a flexible budget is to be correctly compiled, an

accurate classification of expenses (between fixed, variable and semi-variable) is necessary.

I.C.M.A. defines them as follows:

Fixed cost: a cost which tends to be unaffected by variations in volume of output.

Variable cost: a cost, which tends to vary directly with volume of output.

Semi-variable cost: a cost, which is partly fixed and partly variable.

The production cost budget fro different volumes of output is prepared at the time of budgeting itself. If the original target is made for 5, 000 units (100./.) production, simultaneously cost figures for 4, 500 units (90./.) 4, 000 units (80./.) 5, 500 units (110./.) and 6, 000 units (120./.) will also be made. If the concern is following fixed budgetary control it will prepare the budget on the basis of the production target of 5, 000 units alone. When the volume of output is only 4, 000 units, there is no doubt that there will be large variation between the budget figures and actual figures. It may be mainly due to the variance in the volume of output itself. Hence, this variance will not reveal the efficiency or inefficiency of the different functions. Assume that the actual output is 4, 000 units at the end of the period and actual costs are:

		Rs.
Fixed cost	-	20,000
Semi variable cost	-	27,000
Variable cost	-	40,000
		87,000

If the company is following fixed budgeting system, it may have already prepared budget figures for 5, 000 units. Then the variance will be:

Fixed Budgeting

It appears that the actual costs are far less than the budget costs, But it is mainly due to the reduction in the volume of output. If the same company follows flexible budgeting system the real variance between targeted figures and real figures can be found out.

Flexible Budgeting

Budget Figures for various levels of activity

Budget variance will be calculated as follows:

B) Formula method or Budget cost allowance method

Under this method, a budget is prepared for the anticipated normal level of activity and later on, an allowance will be made for variable cost for the number of units by which the actual output differs from the budget output. For instance, let us assume that the production cost budget is prepared at Rs. 4,000 on the basis of normal production level, which is 80% of capacity. Again let us suppose that the budget cost consists of fixed cost Rs. 1, 600 and variable cost per 1% production which is

Rs. 30 [4,000 – 1600/80% = 30]

actual production attained is 85% the variable cost allowed will be Rs. 2,550 (Rs. 30 x 85). This cost plus fixed cost i.e. (Rs. 2, 550 + 1, 600) = Rs. 4,150 will be the cost allowed by the actual production level. Hence, the formula for calculating production cost budget allowed is stated as follows:

Expense Budget Allowed = Fixed Cost + (Actual units of output x Variable cost per unit of output)

C) Graphic method

By drawing a graph which shows the total actual past expenses of varying levels of output and reading off from this graph, the total expense for any given level of output can be obtained. Of these three different methods the first method is the easiest to use and will give results for a limited range of activity level. If the output fluctuates heavily, the second or third method world be the better ones to use. The formula method will yield a greater accuracy while the graphic method achieves greated speed.

5.3 FUNCTIONAL BUDGETS

Earlier in this lesson the mechanics of Budgetary Control System was discussed Now, we discuss the different kinds of budget that a business concern can prepare and how they are being prepared.

Usually a business organization will prepare a budget for each of its function. Purchases, sales, production etc.. are being treated as separate functions and for each such function, a budget will be prepared (e.g.) Sales Budget, Purchases Budget, Production Budget etc. All are being called 'Functional Budgets'. Since all these functions are generally carried out by separate departments these budgets can also be named as "Departmental Budgets".

There are a number of functional budgets, depending on the size and nature of the business that a concern can prepare. But the following are the often used budgets.

1. Sales Budget
2. Selling and Distribution Costs Budgets
3. Production Budget
4. Production Cost Budget
5. Raw Material Budge.
6. Purchases Budget
7. Direct Labour Budget
8. Factory or Production Overhead Budget
9. Administration Cost – Budget
10. Capital expenditure Budget
11. Plant Utilisation Budget
12. Research Development Cost Budget
13. Cash Budget
14. Master Budget

1. Sales budget

The sale budget shows what products will be sold in what quantities and at what prices. In other words, it is a statement of planned sales in terms of quantity and value. The estimation of probable sales is the most difficult of any of the budget forecasts and yet it is the foundation on which all other budgets are built. A business house earns profit not at the point of production, but only at the point of sales. There is no point of producing goods that are not likely to be sold. It is also not uncommon in some industries that only after getting the sales order they will start to produce the products. But in most of the industries the

business has to rely on the estimation of the Sales Department Hence, sales forecast is the keystone of the budget structure.

The sales budget furnishes information on the revenue receipts from which cash receipts from customers can be estimated and supplies the basic data for constructing budgets for production cost and selling and administrative expenses. This means if the sales budget is inaccurate, the whole budget system will be distorted.

There is no doubt that the method of preparing the sale budged will differ widely according to the type of business. For instance, it is far more difficult to estimate sales of ice cream or hotel accommodation than is to estimate those of a stable product like scooter. Anyhow, there are some common factors which may have to be considered in forecasting sales. They are:

1. Assessments by salesmen

It seems reasonable that before fixing sales forecast, some attention should be paid to the views of the salesmen. Salesmen are in the field. They can provide a rather vivid picture of sales possibilities by assessing the local conditions. One way of obtaining information from the salesmen is to ask them to conduct a survey of market conditions of their territories just prior to the beginning of fiscal year; another way is that of getting regular reports monthly or more frequently regarding sales conditions. To attain uniformity, a general approach to forecasting van be given in the manual to the entire salesman.

2. Analysis of past sales records

The assessments of salesmen may sometimes prove to be either overestimation or underestimation. When the past sales figure is taken as the basis to estimate the future sales, such error may not arise since they are matters of historical fact. Moreover, when the demand is steady, the concern can calculate the future sales on the basis of past sales without any difficulty. Unless conditions have changed, it may be expected that trends in the past will continue. Before estimating future sales on the basis of past performance, the past sales should be so analysed as to disclose separately the long-term trend, cyclicaland seasonal movements and chance of fluctuations due to such events as strikes and lock-outs. Then alone, a more accurate estimation can be made.

3. Market analysis

Market analysis may be employed to do the proper and periodic surveys on the state of market, consumer preference, their tastes, the activities of competitors ets: The reports of the analysis may also include information regarding the consumer's behavlour, their age, income, substitutes in the market, price, credit discount, advertising and sales promotion policies. When the data so collected are analysed useful information regarding the pulse of the market can be obtained. In the case of a new product a concern has no past experience to guide its policy and is forced to do this market analysis.

4. Company conditions

A change in company policy and methods should also be taken into account. For instance, a new design for a product, additional advertisement campaigns, introduction of after – sales service and improved channels of distribution must be considered before fixing the sales forecast.

5. Business conditions

There are some political and economic factors, popularly known as "business barometers" which should be noted in preparing sales forecasts. For instance, the governments decision to enhance the public expenditure may lead to increased demand for various type s of products. Likewise, the following are other important indices of general business conditions.

1. Wholesale Price Indices
2. Bank Policies
3. Interest Rates
4. Purchasing power
5. Government's budget allocations
6. Population growth
7. Change in tariff policy

6. Special conditions

Every business concern may have its own special problems which may affect its sales, for example, when an industry produces commodities for another industry, it must analyse the sales prospects of the latter industry. A type manufacturing concern cannot be indifferent to sales of cars or trucks. Even

some natural factors like flood may affect one business adversely and others favourably.

Normally the sales budget is prepared to furnish the following information:

1. Product wise sales

A business concern usually produces more than one commodity. It is obvious that the management must know the sales trend of each type of product. Then alone it can maximize the profit by determining a suitable product mix. Moreover, if a company produces five different models of a product, it is necessary to specify in the Sales Budget how may of each type will be sold so that proper arrangements can be made to plan for their manufacture.

2. Area wise sales

Where a business has separate sales organizations covering various geographic areas, sales forecast by areas or territories are needed to control sales effort conducted in the different areas. Analysis of sales area wise leads to the fixing up of quota to individual salesman or each group of sales representatives. If these variance between budgeted target and actual result, the individuals responsible can be asked to explain and proper corrective action can be taken. Moreover analysis of sales by area is important to understand the fact that whether it is profitable in selling the products in that particular area by comparing the revenue coming from that area with cost of supplying the product in that area.

3. Period wise sales

Short-term sales forecasts, say for a month, will enable the business house to exercise a close control over the sales efforts.

4. Sales based on customer classes

A business may have various types of customer such as wholesalers retailers, chain stores etc., and the products may be sold for them at different prices. Analysis of sales by customer classes becomes necessary to estimate incomes and cash receipts form each type of customer.

When the sales forecast is calculated, it is evaluated and becomes sales budget. The sales budget will be submitted to the budget committee. The budget

will be prepared by coordinating the figures of sales budget and production budget.

Given below is an example of a quarterly sales budget for 2003

2. Selling and Distribution Costs Budgets

The selling and distribution costs budgets are directly relation to the sales budget. Sales will be determined to some extent by the amount spent on selling efforts and distribution costs depend upon the units sold. Hence, the costs of achieving the expected sales have to be estimated at the same time where the sales budget is being prepared. Distribution costs are also conveniently considered at the same time.

Selling costs budget

Selling costs include all items of expenditure on the promotion and maintenance of sales. Advertising will form part of this budget but in some business houses, advertising has come to play such an important part of the business activities that a separate advertising budget is made. Other expenses included in selling costs budget will be all sales promotion expenses, sales office expenses, salaries and commission of salesmen, credit and collection expenses etc. The budget will normally be prepared by the sales manager.

The selling costs are also divided into fixed costs, variable costs, and semi-variable costs as in factory overhead budget. Sales office rent, room rent, depreciation, insurance, administration costs of sales office can be treated as fixed costs. A major item in the selling costs budget will be advertising. If it is included in this budget the advertising costs may be treated a fixed or variable; it all depends upon how it is hoing to be estimated. If it has been calculated by setting up a definite percentage disregarding the volume of sale sit will become variable. Salesman's commissions and the stationery expenses and postages expenses will be variable. We can cite salesman's commission, their telephone expenses and traveling expenses as examples for semi-variable expenses. The division of these three types of costs is, of course, arbitrary. Much depends upon the basis used for computing the payment.

The cost of maintaining the debtor's ledger, sending out invoices and statements, collecting difficult debts, the cost of bad debts written off and the capital costs involved in giving credit can all be considered as selling cost. But

they are not always so treated that administrative budget often bears these expenses.

The selling cost budget must be built up from detailed forecasts prepared from the lowest level, showing the individual salesman's territories, the anticipated cost of commission, traveling expenses, telephone, postage etc. No doubt that the past experience can be no more than a guide. The changes likely to occur have to be foreseen and taken into account.

Since sales always fluctuate, most of the business houses construct a flexible budget instead of a fixed budget for the selling costs.

Distribution cost budget

Distribution expenses are concerned with ensuring that the finished products reach the consumer. It has got its own two divisions: (a) transport costs (b) storage and warehousing costs. In distribution costs budget also all the costs are to be classified as fixed, variable and semi-variable.

The calculation of the costs of transportation largely depends upon what mode of transportation is utilized, because the rate of transportation varies with the mode. Moreover, the distance between warehouses or depots or from some other source and the customer's place will naturally affect the transport charges.

Selling Cost Bedget Period

S.V. = Semi Variable V = Variable F = Fixed

Distribution Cost Budget

Expenses	Fixed/ Variable/ Semi Vairable	Fixed Element Rs.	Variable Element per Standard Rs	RS	RS	RS	RS
TRABSOIRT CIST							
OUTSIDE TRANSPORT							
Road	V.						
Rail	V.						
Air	V.						
Ship	V.						
OWN TRANSPORT.							
Vehicle Costs	S.V.						
Administration	F.						
Standing Licences and Costs Insurance	F.						
Crew's wages	S.V.						
Depreciation etc	V.						
Fuel	V.						
Running Oil	S.V.						
Costs Repairs and Maintenance							
Tyres	V.						
STORAGE & WAREHOUSING COSTS							
Management and Clerical	F.						
Rent of Warehouse	F.						
Power and Light	S.V.						
Insurance etc	F.						
Total							

3. Production Budget

"Production budget deals with determination of the total estimated volume of production with the division of the estimated output into classes or types of products, with the scheduling of operations by days, weeks and months, with the establishment of finished goods, inventory requirements and finally with the storage of finished products until delivery van be made in accordance with sales order". In short, production budget is meant for estimating the expected output of each product in the forthcoming budget period.

Which budget should be prepared first – Sales budget or Production budget? It largely depends upon the nature of the business, the variety of products and the complexity of products. Anyhow in majority of the cases, production budgets are made up on the basis of the Sales budget.

The budgeted production of any period is determined on the basis of level of finished goods inventory proposed to be held at the end of the period and the opening inventory of finished goods, in addition to the Sales budget. In short

Budgeted production = Budgeted Sales plus planned closing inventory of finished goods and opening inventory of finished goods.

Example:

Preliminary data have already provided the following Inventory information for

"Tomcat Ltd".

Finished goods on hand, January 1 ...2,000 units.

Inventories needed to meet future sales requirement.

January 31	-	2250 units
February 28	-	2,500 units
March 31	-	2,500 units

With the data provided by the sales budget and the inventory summary, a production budget can be set up as shown below

In the example, we have taken sales budget as the basis for the preparation of production budget. If the productive capacity is insufficient to meet sales requirements, the management has to make alternative arrangements to ensure that demand is met fully.

It is the function of Budget Committee to make reconciliation between sales budget and production budget and to suggest necessary actions to be taken for this purpose.

4. Production Cost Budget

This budget expresses the details given in the production budget in terms of cost. It includes the cost of three elements normally incurred in the process of production –material, direct labour and overhead. Separate budgets for these three elements also will be prepared. Costs will be analysed department – wise and product – wise. Assume that two kinds of products are being manufactured by particular business concern. Then, a specimen of production cost budget may look like the following.

5. Raw Material Budget

The Raw Material Budget indicates the estimate volume and cost of all the material and components required for the output revealed by the production

budget. The cost of each raw material will be calculated by taking into account the standard price of each material fixed already. This budget furnishes details and data regarding raw materials to the production department for the preparation of production cost budget and to the purchasing department for purchases budget.

To manufacture a finished product, more than one type of raw material may be needed. Likewise, for the production of more than one finished product a number of raw materials may be needed. The raw materials budget has to show the required quantity of each such raw material and their cost in addition to the total of all..

Assume that a particular company manufactures two kinds of products for which four types of raw materials are needed. The raw materials budget for the company will consist of details as follows:

X - it denotes number of units

NR - it denotes Not Required

6. Purchase Budget

This budget gives details of the purchase which must be made during the period to feed the requirements of the business. Many factors such as the amount of working capital available, warehousing facility, Insurance on inventories, cost of handling stocks and the price fluctuation have to be taken into consideration before fixing the targeted purchases. Anyhow generally the purchases budget is prepared on the basis of the raw materials budget vis-à-vis desired ending and beginning raw material inventory level. In other words, the Purchases Budget is derived from –

a) The quantity of raw materials (estimated in raw materials budget required for production.

b) The level of materials inventory to be maintained at the end of period.

c) Level of opening inventory of materials.

d) Standard price per unit of materials.

The budget purchases will equal to = [a+b-c] x d

Another important factor to be considered at the time of the construction of purchases budget is the setting of maximum inventories, which should be maintained at a particular time. These limits will be fixed by taking into account a number of factors such as amount of time needed to replenish the stock of each class of materials, or lead time, the volume of materials which will be consumed each month, week or day, delays in transportation and rush orders.

7. Direct Labour Budget

Direct Labour Budget is constructed on the foundation of Production Budget. The Labour Hours required for the budgeted production would give management information of director labour requirements. The product of the labour hours and the standard rate per labour hour would give the direct labour cost of the budgeted production. In other words, the Labour Budget shows the estimated labour requirements in terms of some physical factors such as man hours or machine-hours and also in terms of financial factors obtained by interpreting the physical factors in monetary terms.

The preparation of the direct labour budget consists of three stages.

The first is the estimation of the labour requirements in terms of number. Different grades of labour such as skilled, semi-skilled and unskilled will be established for both male and female. The number of direct labour needed is calculated by applying standards to the number of units to be produced. Thus, if the current work standard is 1 hour of direct labour per unit of product A, then budgeted direct labour for 1, 000 units of Product A would be 1,000 hours. If only 500 units of Product A were produced, then the actual hours of direct labour would be compared with 500 hours. The hours are then converted into labour requirements.

The last stage is the calculation of direct labour cost by bringing together the number of workers and appropriate standard wage rate.

8. Factories or Production overhead Budget

This Budget is meant for estimation of factory overhead cost. Over-head is the term generally applied to those which cannot be traced directly to a particular unit of output. Certain items of overhead may be determined directly

fro a machine, an operation or a department but will be indirect to the unit of output. All indirect costs (overheads) likely to be incurred by the factory have to be taken into account. The factory overhead budget falls into three parts i.e., fixed overhead, variable overhead and semi-variable overhead. Fixed overhead will not be affected by the volume to output. It is comparatively easy to estimate with accuracy (rent, rates, insurance etc.). Variable overhead will vary directly with volume of output (consumable stores, scrap etc.). Preparation of this part of the budget involves close co-operation between the accountant, the heads of departments and the engineering staff, because technical estimates are often needed.

The term semi-variable is used here to represent those costs which are not fixed in total over the entire range of production or which do not vary in total directly with production. They are partly fixed and partly variable (power, light maintenance etc.). It is relatively more difficult to incorporate semi-variable costs into the budget control system.

But, it is not easy to differentiate these three types. If the distinction is made in a business the overhead budget can be easily drawn. Since the fixed overhead does not change in accordance with the volume of output, the cost of each type of overhead will be estimated by taking into consideration the records of past experience and the future changes in their cost likely to occur. Rates for many of the overhead expenses such as tax, insurance rent are either already known or can be calculated with greater degree of accuracy.

For the estimation of variable and semi-variable costs, help of various department heads have to be sought. For instance, indirect materials, indirect labour, and repairs can be estimated only through the co-operation of the foreman and the factory executives. Moreover, the expected products have also to be considered because these costs vary with the production. The costs of power heat, light and water are generally estimated by the cost accountant with the help of the engineering staff and the major factory executives. No doubt that the records of past experience also will be considered for all these estimations. The production overhead budget must show the total amount of each class of cost classified by various production departments.

9. Administration cost budget

This budget is concerned with those costs which are all management, administrative and office expenses and which do not specifically relate to any other budget. General management, the general office, legal branch, public relations department etc,, all give rise to the expenses of salaries, stationery, telephone, traveling and scores of other items.

The preparation of administrative cost budget, requires the same care as the other budgets. With minor variations in business activity, administrative costs will remain fairly constant and therefore, p re- determination should present no great problem. For instance, salaries of various executives, lawyers and others, rates, taxes and rent are all fixed costs. Some costs are of a semi-variable nature (e.g.) traveling costs, stationery, deprecation, office machinery and supplies.

Past experience plus known changes in the number of personnel and in procedures are taken into consideration to estimate the budget.

10. Capital Expenditure Budget

This budget will show the future expenditure on fixed assets such as land and buildings, plant and machinery, equipment, furniture etc. This budget may have a different time span from the other budgets. Indeed it will be prepared for a number of years because of its long-term implications. Capital Expenditure budget is usually prepared by to p management in consultation with engineering and technical services as large amounts of expenditure are involved.

The necessary information for the preparation of capital expenditure budget will be obtained from-

(a) the plant utilization budget – particularly when it shows overloading

(b) requests form production department for new types of plant

(c) requests for new vehicles from transport manager and machinery

(d) requests form the chief accountant for new office machinery

(e) the main devélopment plans of business which may require the additional plant or factory for enhancing the output.

Since large amount of capital is going to be invested over a long period of time, this budget is generally prepared after a comparative evaluation of the various investment opportunities and alternatives. Increased capital expenditure gives rise to the problem of future financing of the business. The financial source from which the necessary funds can be raised has also to be determined (i.e.) whether it is through self financing or by raising funds on a along term basis from outside sources. These problems can be tackled only by a thorough investigation on the stability of the demand and the expected return on the enhanced investment.

Capital Expenditure Budget will be compiled with the necessary information received from various departments. The estimation of the cost of various fixed assets required by various departments includes the purchase price of the assets, delivery cost and the company's own internal costs connected with installation and related work.

CAPITAL EXPENDITURE BUDGET

Period : ....

11. Plant Utilisation Budget

The budget deals with the requirements of plant and machinery and it is directly dependent upon the production cost budget. Plant and equipment budgets are generally based on long-term forecasts. Public utilities such as telephone companies and power concerns are noteworthy examples of organizations basing their expansion plans on long term budgeting. As a budget covering the plant and machinery requirements, schedules will be prepared to show the available capacity, for each production department usually, expressed in terms of standard hours or units. By comparing these schedules with the production budget it will be possible to t ell whether plant and machinery – will be over – loaded or under- loaded. If under-loading is the case, steps to boost sales have to be taken or the idle plant must be scrapped. If over loading is the case, arrangements have to be made for working in shifts or overtime or for purchasing a new plant. When there is a need for the purchase of new plant it comes under the purview of capital expenditure budget.

Plant Utilisation Budget

Period: ....

12. Research and Development Costs Budget

The aim of the research and development is to develop new product or new processes, existing products. The development of a new product or a new process, generally requires a great deal of investment in facilities. It gives those research specialists an indication of the resource at their disposal. The budget is usually prepared in two parts (i) fixed expenses necessary to maintain research and development work at the irreducible level and (ii) cost to be incurred on completing the projects on hand or on those to betaken up.

13. Cash Budget

It is important that the right amount of cash be provided for operating the business. Insufficient amount of cash on hand may indicate the fact that this liquid asset is not properly utilized. Further, the cost of capital in proportion to the amount of idle cash is a wasteful expenditure to the company. Hence, Cohen and Roboins rightly observe that "the regularization of cash changes – which are the outcome of many related activities cannot be trusted to chance. Management must have a good idea in advance of when and how much of cash will be needed to carry out the firm's activities because it may be difficult to make suitable investment plans quickly to overcome cash shortage after it has occurred. The cash budget is the crystal ball that enables management to observe future cash movements."

All entries in other budgets which are concerned with monetary transactions will affect cash budget. For this reason this budget is generally compiled after all other budgets are prepared. The cash budget is a forecast of expected cash receipts and cash payments and it is normally prepared for the same period (usually one year) as for the other budgets. The budget may well be analysed month-wise, so as to show and revise, if necessary, the cash position. In fact, some business houses are preparing cash budgets for shorter period such as week or a day.

How to prepare a Cash Budget

The cash budget for a period will begin with the opening balance o fcash in hand and at the bank. To this, all cash receipts will be added. Cash sales and collection of customer's accounts, are the main sources of cash receipt. These figures can be derived from Sales Budget. Anyhow, it must be noted that the monthly sales and actual cash receipts must be adjusted in cash forecasting because of the lag in payment by debtors.

Suppose, sales for Rs, 10, 000 on credit basis took place in the month of January and a period of two months credit was allowed to debtors. In what month will the proceeds be collected? No doubt only in the month of March. Hence, these cash receipts should be taken into account only for the month of March at the time of the preparation of the budget, though the sales were effected in the month of January.

The other sources of cash receipts are – customer's bill receivable, interest and divided earnings, proceeds from sale of capital assets, borrowing etc.

For the total of cash receipts, the cash disbursements should be deducted. Major items among the cash payments are the cash purchases and disbursements to creditors. The information can be got from Purchases Budget. Here also, the period of credit allowed by the creditors should be taken into account.

Assume the credit purchases of Rs. 20,000 were made in the month of April and period of credit allowed by the creditor was 3 months. Then, we have to pay cash only in the month of July.

Next major item in the cash disbursements is the labour costs. The labour budget will reveal these costs. But we must remember the fact that the payment for the work done in a particular month are usually paid in the coming month. The lag in the payments some times, may be more than a month also. This means that the same type of calculation which we made in the payments to creditors have to be done here also. Information regarding other important payments, say, for overhead costs and capital expenditures can be derived from the overhead budget and capital expenditure budget respectively.

Against all the receipts will be set all payments. Sometimes, the cash receipts may not be sufficient to cover all disbursements. In such a situation, the

business house should try to arrange for short term or long term borrowing. When receipts are more that payments in value, the remaining amounts may be invested either in short term or long term securities in accordance with the period for which the excess funds are not required.

Thus, Cash Budget mainly derives its contents from other budgets which anticipate cash inflows, and outflows. To prepare Cash Budget all other budgets must have been prepared already. In other words, Cash budget is interlinked with other budgets.

Illustration: 1

From the following particulars of Fox Bat Co. Ltd., you are required to construct a Cash Budget for the period of 4 months commencing from Jan, to April 1996:-

	EXPECTED SALES	EXPECTED PURCHASES
	Rs.	Rs.
Jan -	1,20,000	96,000
Feb -	80,000	1,60,000
Mar -	90,000	1,62,000
April -	80,000	1,80,000

Wages to be paid to workers Rs. 10,000 per month: Balance at bank on - 1-96 Rs. 16,000.

Solutior

CASH BUDGET OF FOX BAT COMPANY LTD.

Period-months ending 30th April 1996

Note:

When the total of receipts exceeds the total of payments for a particular month, the surplus is carried over to the near month, On the other hand, if the budgeted payment exceed the budgeted receipts, the deficit has to be met out of funds raised by way of overdrafts or by issuing debentures. If nothing is specifically stated in the deficit to the next month in order to find out the cumulative effect at the end of the budgeted period.

Budgeting and Budgetary control

NOTES

Check your progress

2. Fill in the blanks

a) A budget is a __________ for a particular period

b) __________ prevents a business from its expansion.

c) __________ is the basis for sales budget.

d) Summary of all functional budgets is known as __________

e) A flexible budget is also known as __________ budget

Lllustration:2

Deriving information as in example 1, assume that the management of Fox Bat Company Ltd., decides on the following courses of action.

(a) In case of cash deficit of within the limit of Rs, 20,000, overdraft facility be

arranged.

(b) In case of deficit of cash exceeding Rs. 20,000 but within the limit Rs. 90,000

issue of debentures is preferred

(c) In case of deficit of cash exceeding Rs. 90,000, share can be issued within the

limit of Authorished capital.

Solution:

CASH BUDGET OF FOX BAT COMPANY LTD.

Period – 4 months ending 30th April 1996

Note:

It is assumed that the issue of shar ges Rs. 1,10,000 (during the month of April) will still keep the issued capital within the overall limit of the Authorized capital.

Illustration:3

Spic and Span Co., wishes to arrange for overdraft facilities with its bankers during the period from April to June 1996 when it will be manufacturing mostly for stock. Prepared Cash Budget for the above following data. Indicating the entent of facilities the company will requirc at the end of each month.

(a)

1996	Sales Rs.	Purchases Rs.	Wages Rs.
February	1,80,000	1,24,000	12,000
March	1,92,000	1,44,000	14,000
April	1,08,000	2,43,000	11,000
May	1,74,000	2,46,000	10,000

June	1,26,000	2,68,000	15,000

(b) 50 per cent of salaries are realized in the month following the sales and the remaining 50 per cent in the second month following; Creditors are paid in the following month of purchase. Wages are paid in the following month.

(c) Cash on hand on 1-4-96 (estimated) Rs. 25,000

Solution:

Cash budget of Spic and Span co. ltd.

period:3 months ending 30th June, 1996

Workings:

(i) Cash receipts from sales have been calculated by taking 50 p.c. of sales of preceding month plus 50 p.c. of the sales before the preceding month:

			Rs.
For April:	50% of Feb. Sales Rs. 1,80,000	=	90,000
	Plus 50% of March Sales Rs. 1, 92,000	=	96,000
			1, 86,000
May:	50% o fMarch Sales Rs, 1, 92,000	=	96,000
	Plus 50% of April Sales Rs. 1,08,000	=	54,000
			1,50,000
June:	50% of April Sales rs. 1,08,000	=	54,000
	Plus 50% May Sales Rs. 1,74,000	=	87,000
			1,41,000

(iii) As the creditors are paid in the month following the month of purchase, the purchases of preceding month have been taken for the payments. (e.g.) For the payments in the month of April, the purchases of March have been taken into account the same is the treatment from wages.

Illustration: 4

Hale and Wale co.Ltd., wants to prepare Cash Budget for the first quarter of the ensuing year ending on 31st December. The following information is available from other budgets which have been already prepared.

Creditors are allowed a credit period of 2 months.

Debtors are allowed by us a credit period of 3 months

Lag in payment of overheads and wages is 1 month

The Cash balance on 1st January is expected to be Rs. 1, 00,000.

Other details available:

(a) Plant and machinery to be installed in January at a cost of Rs. 25,000 will

Be paid for by monthly installments of Rs. 5,000 from 1st Feb. Extension to the

Research and Development Department at a cost of Rs. 5, 000 will be completed

1st Feb. the payment is to be made on 1st March.

(b) A sales commission of 10% on sales is to be paid within the month following actual sales

(c) Cash sales of Rs, 5,000 per month (apart from sales figures given above) are expected, no commission is payable on them.

(d) The company has hire purchase agreement under which Rs. 10, 000 a month is being paid for plant purchased before this budget period Payment will continue throughout this budget-period.

(e) Preference dividends of 5% on Capital of Rs. 24 lakhs are to be paid on 1st March.

(f) Tax of Rs. 50, 000 is due on 31st March.

(g) Re. 0. 25 calls on equity share capital of Rs. 2 lakhs; face value per share is Re. 1 are due as on 1st January and 1st March.

Solution:

Hale and Wale Co., Ltd.,

Period: 3 months ending 31st March

	JANUARY Rs.	FEBRUARY Rs.	MARCH Rs.
Balance	1,00,000	1,60,500	1,52,600
RECEIPTS:			
Debtors	80,000	60,000	40,000
Cash Sales	5,000	5,000	5,000
Capital (Calls on Shares)	50,000	-	50,000
Total	80,000	2,25,000	2,47,000
PAYMENTS:			
Creditors	30,000	20,000	40,000
Labour	8,000	9,000	10,000
Production Overhead	8,000	8,200	8,500
Administration Overhead	4,500	4,700	4,900
Selling Overhead	5,000	5,400	5,800
Distribution Overhead	3,000	3,400	3,600
Research and Development Overhead			
Commission	2,000	2,200	2,200
Hire Purchase Amount	4,000	5,000	6,000
Instalment Payment	10,000	10,000	10,000
Payment for Extension	-	5,000	5,000
Dividend	-	-	5,000
Tax	-	-	1,20,000
Total	-	-	50,000
Total Receipts	74,000	72,000	2,71,000
Less: Total Payments	2,35,000	2,25,000	2,47,600
Balance (Cash available)	74,500	72,900	2,71,000
Deficit.	1,60,000	1,52,000	-
	-	-	23,000

It can be seen from the budget that the company has insufficient cash to finance its operations during the month of March. To make up the deficit the company can approach its banker to raise overdraft for the necessary amount. If not, payments to the tune of Rs. 23,400 have to be postponed to the next month.

Illustration:5

From the following budget figure of Good and Better Co. Ltd. Prepare a cash Budget in respect of three months up to june 30.

Months	Sales Rs.	Materials Rs.	Wages Rs.	Overhead Rs.
January	60,000	40,000	11,000	6,200
February	56,000	48,000	11,000	6,600
March	64,000	50,000	12,000	6,800

April	80,000	56,000	12,400	7,200
May	84,000	62,000	13,000	8,600
June	76,000	50,000	14,000	8,000

Expected cash balance on 1st April is 20,000

Further Information:

a) Materials and Overhead are to be paid during the month following the month of supply.

b) Wages are to be paid during the month in which they are incurred.

c) Terms of sales:

d) Preference dividend for Rs. 30,000 is to be paid on 1st May.

e) Share call money for Rs. 25, 000 is due on 1st April and 1st June

f) Plant and Machinery worth Rs. 10,000 is to be installed in the month of January

and the payment is to be made in the month of June.

Solution:

CASH BUDGET OF GOOD AND BETTER CO.LTD

Period: 3 months ending 30th..............

Working:

	Rs.		Rs.
A) ½ March	32,000	(B) ½ April	40,000
½ Feb	28,000	½ March	32,000
	60,000		72,000

	Rs.		Rs.
(c) ½ May	42,000	(D) $\frac{5}{100}$ x 64,000 =	Rs.3, 200
½ April	40,000		

E) $\frac{5}{100}$ x 80,000 = Rs. 4,000

(F) $\frac{5}{100}$ x 84,000 = Rs.4, 200

In the problem it has been assumed that the deficit amount of Rs. 5,600 expected in the month of May has been carried forward to the month of June since no information regarding O/D facility has been given.

Illustration:6

From the following information of MOUNT AND VALLEY CO. LTD., prepare monthly Cash Budget for the three months ending 31st December.

1. Forecasts:

2. Credit items are:

(a) Sales – 3 months to debtors – 10% of sales are on cash. On an average 50% of credit sales are paid on the due date while the other 50% paid in the month following.

(b) Creditors (materials). 2 Months.

3. Lag in payment.

Wages	-	¼ month
Overhead	-	½ month

4. Cash in Bank on 1st October is expected to be Rs. 3,000

5. Other relevant information are:

(i) Plant and machinery to be installed in August at a cost of Rs. 48,000 will be paid for by monthly installments of Rs. 1,00 ... months as from 1st October.

(ii) Preference dividends of 5% on capital of Rs. 1,00,000 are to be paid on 1st December.

(iii) Calls on 500 Equity Shares at Rs. 2 per share are expected on 1st November

(iv) Dividends from investments amounting to Rs. 500 are expected on 31st December.

(v) Income Tax (advance) to be paid in December Rs. 1,000.

Solution:

CASH BUDGET

Period-3 months ending 31st December ....

Working

Receipts from Sales

Months	Sales Rs.	Oct. Rs.	Nov. Rs.	Dec. Rs.
June	6,000	2,700	-	-
July	6.500	2,925	2,925	-
August	7,000	-	3,150	3,150
September	7,500	-	-	3,375
October	8,000	800	-	-
November	8,500	-	850	-
December	9,900	-	-	900
	Total	6,425	6,925	7,425

*10% of Rs. 6,000 (June Sales) = Rs. 600 is Cash Sales

Credit Sales = Rs. 5,400 (Rs. 6000 –Rs. 600)

50% of Rs. 5, 400 to be realized after 4 months (i.e.) in the month of October. In this way other figures have been calculated.

Wages:

October: ¼ the of September plus ¾ the of October wages.

¼ of Rs. 1,500 = Rs. 375

¾ of Rs. 1,600 = Rs.1, 200

Total Rs.1, 575

In this way the other figures have been calculated.

Overheads:

October: ½ of September plus ½ of October overheads.

(Ex) Production: O.H.

½ of Rs. 600 = 300

½ of Rs. 600 = 300

Total Rs. 600

In this way other figures have been calculated

14. Master Budget

There are two views in giving definition for the term "Master Budget". Though it is generally considered as a summary budget which incorporates the details o fall other principal budgets, difference of opinion exists on the form the summary budget should take.

Some authorities are of the opinion that Budgeted Profit and Loss account and Budgeted Balance Sheet constitute the master budget. Once all the individual budgets have been prepared it means that all the budgeted figures required for the preparation of the final account are available and hence it is possible to construct Budgeted Profit and Loss Account for the Budget period and Budgeted Balance Sheet at its close.

According to another definition the "Master Budget" incorporates in itself the information from all functional or departmental budget in addition to Budgeted Profit and Loss Account and Budgeted Balance Sheet. Obviously this definition gives wider meaning to "Master Budget".

The master budget will be prepared by the budget office and has to be approved by the budget committee. On approval, the master budget will be submitted to the board of directors.

The master budget so prepared should be carefully examined by Directors who must be satisfied not only that the profit planned for represents a reasonable return on the capital invested, but also the Budgeted Balance Sheet shows a position of stability at which it is desirable to aim at.

5.4 KEY TERMS

• **Budget:** "A financial and / or quantitative statement, prepared and approved prior to defined period of time of the policy to be pursued during that period for the purpose of attaining a given objective. It may include income, expenditure and employment of capital". • **Budgetary Control** : "Budgetary control is the establishment of budgets relating to the responsibilities of executives of a policy and the continuous comparison of the actual with the budgeted results, either to secure by individual action the objective of the policy or to provide a basis for its revision.

- **Budget Manual:** Document sets out the responsibilities of the person engaged in the routine of and the forms and records required for budgetary control.
- **Flexible Budget:** A Budget prepared for various levels of output.
- **Functional Budgets:** Budgets prepared for each function of an organization.

5.5 SUMMARY

Budgetary control and standard costing systems are two tools frequently use by business executives for the purpose of planning and control. In the case of budgetary control, the entire exercise starts with the setting up of budgets or targets and ends with the taking of an action, in case the actual figures differed with the budgetary ones.

Budgets are usually, set up in the light of past experience after taking into account the changes that are expected to occur in the future. It is, therefore, to be expected that actual figures will correspond to the budget unless there is some important change in that conditions. In fact, it must be the constant endeavour of the management to see that change.

5.6 ANSWERS TO CHECK YOUR PROGRESS

1. a) True   1 b) True   1. c) False   1. d) True   1. e) False

2. a) Plan   b) Budget factor   c) Production

d) Master Budget   e) Variable

5.7 QUESTIONS/EXERCISES

1. Compare budgeting with budgetary control and bring out the objectives of budgetary control.
2. Give a brief account of the necessary organization for the budgetary control.
3. What is meant by Flexible Budgetary control? Elucidate various methods of establishing it.
4. Write short notes on
   - (a) Principal or scarce factor
   - (b) Budget period
   - (c) Budget manual
   - (d) Budget cost allowance method.

5.8 FURTHER READING

Pradeep Kumar - Elements of Financial Management Kedar Nath Ram Nath & Co 1991

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UNIT 6 CAPITAL BUDGETING

Structure

6.0 Introduction

6.1 Unit Objectives

6.2 Capital Budgeting – Meaning and issues

6.3 Appraisal Methods

6.4 Key Terms

6.5 Summary

6.6 Answers to check your progress

6.7 Questions / Exercises

6.0 INTRODUCTION

Financing and investment of funds are two crucial financial functions. The investment of funds also termed as capital budgeting requires a number of decisions to be taken in a situation in which funds are invested and benefits are expected over a long period. The term acapital budgeting means planning for capital assets. It involves proper project planning and commercial evaluation of projects to know in advance technical feasibility and financial viability of the project.

The capital budgeting decision means a decision as to whether or not money should be invested in long – term projects such as the setting up of a factory or installing a machinery or creating additional capacities to manufacture a part which at present may be purchased from outside. It includes a financial analysis of the various proposals regarding capital expenditure to evaluate their impact on the financial condition of the company and to choose the best out of the various alternatives.

In any business the commitment of funds in land, equipment stock and other types of assets must be carefully made. Once the decision to acquire a fixed assets is taken, it becomes very difficult to reverse that decision. The expenditure on plant and machinery and other long terms assts affects operations over a period of years. It becomes a commitment that influences long term prospects and the future earning capacity of the firm.

6.1 UNIT OBJECTIVES

- Describe canital budgeting decisions

- Understand the purpose and process of Capital Budgeting.
- Appreciate the importance of cash flows and understand the basic principles for measuring the same;
- Evaluate projects using various capital budgeting techniques like PB (Pay Back). NPV (Net Present Value). PI (Profitability index), IRR (Internal Rate of Return). MIRR (Modified Internal Rate of Return) and ARR (Accounting Rate of Return); and

Understand the advantages and disadvantages of the above mentioned techniques.

6.2 CAPITAL BUDGETING-MEANING AND ISSUES

We are already acquainted with the various types of business budgets and with the system of budgetary control. Capital Budget is one of the important types of business budgets is one of the important types of business budgets. In this lesson, we propose to give an account of capital budgeting and its integral part of investment decision – making.

Need for Capital Budgeting

The concept of 'going concern' has become an established rule of the modern business. No organization in the present day world can remain static. So, every business organization plans for expansion, improvement, modernization and the like. Thus, to carry on the business on a continuous basis, every undertaking needs some long – term facilities such as land and buildings. Plant and machinery, furniture and fittings etc. also, in course of time, such fixed assets may have to be replaced due to not only wear and tear but also due to the improvements in technology and mode of operation. All these schemes involve huge amounts of money. Spending money in the acquisition of such permanent facilities is called capital expenditure or just investment. Considering the size and duration of investment planning of capital expenditure is a must, hence. the need for capital budgeting.

What does it mean?

Capital budgeting is the process of selection of investment proposals which are worth while for investing the available funds.

Our resources are limited in relation to the number of available opportunities for investment. So, there comes the problem of selection – i.e..

selection of the most profitable project from a range of courses open to us. Thus, Capital Budgeting aims at "optimization of decisions" in order to maximize profits.

Therefore, it involves the following three important steps:

1. Estimation of the available funds for investment (the budget is built on the basis of this figure):
2. Preparation of a list alternative investment proposals;
3. Evaluation of the various projects by means of a number of techniques and selection of the most profitable ones.

Capital budgeting, thus, consists of estimation of investible funds, selection of

investment projects and planning and control of capital expenditures whose returns stretch themselves over a long gestational period.

Various authors have attempted to define capital budgeting in the following manner.

S.Kuchal, defines capital budgeting in the following words:

"Capital budgeting process involves planning the availability, and controlling the allocation and expenditure, of long term investment funds"

He puts three questions to be answered in this process:

1. How much money is "going to be needed' for capital expenditure"
2. How much money is "going to be available' for such proposals?
3. How are the funds "going to be assigned" to the project under consideration?

These three steps = forcasting expenditure, estimation of the available funds and 2

selection of projects (i.e., allocation of funds) – cover the whole process of capital budgeting.

Capital Budget: Anthony defines capital budget as "a list of what management believes to be worth while projects for the acquisition of new capital assets together with the estimated cost of each project".

In the words of Murphy, "the capital expenditure budget will show the future expenditure on fixed assets over a period of say, years".

According to Brown and Howard, "it represents the estimated expenditure on all fixed assets during the budget".

Objectives of Capital Budgeting

The primary objective of capital budgeting is to spread the available investible funds over the capital projects in such an optimum combination as to maximize the total profits accruing from all the investments put together. But means of the various evaluation techniques the most suitable and profitable projects are selected with a specific reference to the relative amount of investment on each project.

In addition to this profit maximization objective, capital budgeting may also have other objectives, such as employment generation, employee compensation and satisfaction (such as employee welfare projects, recreation facilities etc.), provisions for research and development and the like. These are discussed in detail under the caption "Types of investment projects".

Capital Budgeting also at controlling capital expenditure. This is a corollary of the first objective, capital Budgeting helps controlling expenditure by forecasting the long term financial requirements and thereby enabling to plan in advance to raise funds at the most appropriate time. Capital Budget facilitates comparison of the actual expenditure with the budgeted figures so that the cost deviators, if any, can be analysed and checked".

Capital Budgeting determines the total amount of money to be invested on long term projects so that it may be controlled in line with the company's financial policies. A number of companies land on financial crisis by proceeding with investment projects which later on prove to be beyond their resources. Such an undesirable situation can be avoided by preparing a capital budget.

Capital budgeting also tries to compromise between the availability of fund and requirements of capital projects.

Factors complicating the process of Capital Budgetting

Planning, forecasting, budgeting and financing of capital, expenditure projects form a vital part of management, fixed assets and long – term facilities constitute the basis for production. The management takes personal interest and direct control over investment decisions because of the following aspects which makes the process of capital budgeting more complicated.

a. The amounts of money to be invested in capital projects are comparatively huge. While finance is scarce in relation to its demand, investment decisions involving huge amounts will really prove to be a tough job.

b. Usually capital budgeting involves investment in fixed assets whose serviceable life will be considerably longer. This implies that a huge amount of investment is locked up for a longer period of time. The longer the period of investment the greater is the risk assumed.

c. Investment and Return on investment take place at different points of time. i.e., our present investment is expected to earn return in future, (that too spread over a period of time). This makes evaluations of projects more complicated.

d. There are various techniques to evaluate the profitability of a projects, each being applied under the special requirements of the circumstances. The results will not be uniform under all the methods. So controversy may arise as to which particular method should be used.

e. Capital investment decisions are usually for long term in nature whereby future outcome of the investment is affected by multifarious factors. So correct assessment of the future return will pose different problems.

f. As the technology changes too often nowadays the risk involved is also greater in certain cases. When we try to find out the exact and correct information regarding the multifarious factors we may have to spend quiet a large sum of money which will exceed the benefits derived out of such spendings. In case of public enterprises it is not only the economic considerations that are taken into account but also the social benefits, derived out of such investments. In such cases when the social benefits outweigh the economic benefits such projects will be preferred.

g. In certain cases political influence and other non – economic considerations such as availability of funds, providing employment may influence the decisions.

h. When the time of investment and the time of return differs or when the time lag between them widens, problems may be caused in adjusting the returns according to the price levels.

i. Impediments may also be caused when the rate of return, depreciation, expected earning life differ between two projects.

Types of investment projects

Since large amount of capital is going to be invested over a long period of time with a view to earning profits or gaining additional facilities to boost the earnings, top management itself takes personal interest and direct control over

the investment plans and proposals. The various department heads may give their capital expenditure proposals for consideration by top level management. The various kinds of projects may be classified in the following manner, however, the list cannot be exhaustive. It depends upon the nature of business concern, its financial understanding etc.

a.Expansion of existing product lines.

b.New product lines.

c.Replacement of fixed assets.

d.Utilisation of scraps and waste in the production of by products.

e.Utilisation of surplus installed capacity and cost reduction plans.

The above projects are naturally profit oriented and therefore they are evaluated in term of their earnings or reduction in costs or expenditures. But there are other projects which do not directly contribute to the earnings of the organization. They are considered in terms of their contribution to the welfare and efficiency of the employees. Examples of such projects are:

Health and Safety: Welfare projects are sometimes carried out by the company to comply with the requirements of law – e.g. The Factories Act requires factories to provide safety devices against industrial hazards and accidents. Provision of sports and recreation facilities contribute towards the employee morale which does not lend itself to financial evaluation. **Research and Development Projects**

Business organizations have to constantly compete with the other producers and substitutes. New products and new methods of production may be sought for a improve the efficiency of the business. This requires the organization to have a separate department of specialists and research scholars involving huge funds. The results may or may not prove successful in the initial stage. They have to be evaluated only in the longer course of time.

Evaluation and Selection of Projects

The final step in the process of capital budgeting involves evaluating the profitability of the alternative projects and selecting the most desirable one. This is exactly the job Management Accountant. However, this job is highly difficult because of the following factors.

a. A number of alternative projects are available for consideration, so it is a problem of choice.

b. The alternative projects may not always involve the same amount of capital outlay. This makes the comparison difficult.

c. There are different methods or techniques of evaluation of the profitability of the projects; still, no single method can be said to be perfectly suitable for all the types of projects. The different methods save different purposes by giving different sorts of information. So the Management Accountant has to apply more than one technique and get all relevant information.

d. Management Accountant has to estimate the earnings of the future i.e., present investment fetches spread over a considerable period of time in future. One Rupee today is not equal to one Rupee in future day. This time element has to be reckoned with.

e. All sorts of technical information incorporated in the Projects Report (prepared by the relevant technicians) will have to be translated into money values by the Management Accountant because his job is to estimate only the profitability of each proposal.

The experts in Management Accountancy have developed a number of methods

of evaluation over three years. Each method has its own merits and demerits. Therefore, all relevant methods may be applied in this evaluation

Characteristics of a good investment plan:

In deciding about the investment plan the following factors are to be considered;

A. Enough weightage has to be given for the time of the investment, for e.g. If the investment has to be made after some time it can be advantageous factors than when the investment is required to be made now or within a short period of time.

B. Due consideration has to be given for the time of the receipt of the earnings. When earnings are forthcoming within a shorter period that investment may be preferred compared to another investment whose gestations period is long.

C. Adequate plus points should be offered for the economic life of the machine or investment. If the economic life of the one machine is more, that can be preferrd that the one which is having shorter life span.

The method we adopt should be free from confusion and inaccuracies caused due to differing depreciation rates and changes.

Capital Expenditure Control

Formal capital budgeting is still underdeveloped which is of comparatively recent origin. The effects of a decision regarding capital expenditure are permanent and far reaching. They determine the success of an enterprise. Therefore, the management has to operate a system of capital expenditure control in view of the importance of capital expenditure.

Control over capital expenditure is facilitated by the following classification of the outlay:-

1. Major project
2. Routine Expenditure
3. Replacements

The effects of proposed capital expenditure on fixed charges, cash requirements

and proposed earnings should be weighed. Routine expenditure requires control so that multiples of small expenditures in aggregate should not exceed a major single project. To keep the productive capacity of the business intact expenditure on replacement should be favourably viewed.

Any form of capital expenditure control will have the following features:

A. **Constant search:**

There must be complete awareness on the part of all management personal that

long – term expenditure constitutes the basis of profits over long periods. This creates constant search for new methods, profits and products.

B. **Comprehensive planning**

Budget of an organization incorporates all the ideas for future expansion programme. The capital expenditure budget should be so planned as to ensure balanced development of each part of the business as well as of the company as a whole.

C. Justification

Having framed the capital budget, it is vital to see that each project is justified by its forecast profitability. This can be done by using one or more of the systematic rational methods of ranking investment proposals such as Pay Back Methods, Average Rate of Return Method, Discount Cash Flow Method etc.

D. Authorisation

There has to be some routine at every stage request, authorization, progress and audit. Requests for capital allocation should be made periodically and they should be reviewed as they pass upward through managerial level until they reach a committee, which shifts these projects and submits its recommendation to the Board of Directors for final recommendation.

E. Authentication

As a project is carried out, all expenditures should be authenticated as being within the previously authorized budget for the project of the company.

F. Progress

Major capital expenditure project cannot be accomplished overnight. They require the preparation of detailed plans and instructions. The next step consists of insurance of reports during the period in which project is performed. These reports are aimed at observing that the programme remains within limits set by the policy of the company. Moreover, Many unexpected delays may have to be faced. Therefore control of progress is essential.

G. Post completion audits

This is an important phase of the capital expenditure control. Post – completion audits of projects determine whether actual value is in accordance with the one determined at the time authorization. It is also possible to detect those areas where action can be taken to improve future results which may be very valuable in the consideration of future projects.

Limitations of Capital Budgeting

The different methods of ranking investment proposals represent a continuous attempt to a systematic analysis of available alternative proposals as well as improvement of procedure of evaluation. The sophistication and refinement of procedure itself cannot ensure the best possible choice, if the data are wrong. We know that capital budgeting technique involves an entire range of data relating to projections of expectations involving revenue, costs, equipment life, human and material performance etc. Finally, there are factors which cannot be quantified. For example, an investment may have a direct or indirect effect on employee morale or on relations with the community which could canes irrepairable harm, if not carefully judged. Under such conditions, skilful managerial judgement is imperative.

6.3 APPRAISAL METHODS

The various methods can be broadly classified as follows:

1. Methods not considering time element.
2. Methods considering time element.

As we have already notes, time element is important because we invest now but expect earnings in future, and again our present investment is in lump sum but the expected future earning will be realized only year by year. Therefore on this basis of time element the various methods have been classified.

The first group includes the following two methods.

1) Pay-back Method

2) Average Rate of Return Method

The other three methods under second group are:

3) Net Present Value Method

4) Profitability Index Method

5) Internal Rate of Return Method

The last two methods are collectively called The Discounted Cash Flow Techniques. (D.C.F.Techniques)

In this lesson, it is discussed how these techniques can be applied to

evaluate the investment – worthiness of the capital expenditure proposals. The various projects can be evaluated and ranked in terms of their profitability by applying these methods.

6.3.1 Pay – Back method (pay out or pay off period)

This is the most simple but unrefined method. Under this method we calculate the

Period taken by 'project' to 'recover' the investment amount from its future earnings.

$$\text{Formula :- Pay – back period} = \frac{\text{Amount invested}}{\text{Cans tan t Annual Earnings}}$$

For instance a project costs Rs.12,000/- and it is estimated to earn annually Rs.4,000/- net then we understand that our investment is recovered over a period of 3 years. The earnings after this period will constitute profits. Thus it tries to equate the revenue and the capital expenditure over a period of time. In other words, this ascertains the period of time required for annual earnings of the project to equate, with the initial investment. Here the term 'earnings' refers to the profits earned by the project (e.g.a.machine) before charging the depreciation thereon but after deducting the tax and other operating expenses.

The recovery period is called the pay – back period. From this information we can estimate how soon our investment will be recouped. The project which gives the invested capital in the shortest time is the best. Since this method needs only basic information (e.g. regarding the cost of the project, annual income, operating expenses etc.) and does not involve any complicated calculations, it is commonly used along with other techniques. This method tells the management how long it has to wait to take back the money invested on project. This information is useful especially when finance is scarce and when the management is anxious to plough back the money on the other projects awaiting investment.

Illustration: 1

A B C company considers the mechanization of a particular process now carried on by labour. Two models are available. The following estimates are made by the experts:

Calculate the period of time taken by each project to repay the investment amount out of its earnings.

WORKINGS

Note: Here the earnings of the machines are unevenly spread over the years. So the general formula

Investment / Constant Annual Earnings

Cannot be used here. We have to prepare a table as given below.

Pay – back period = 2 ½ years 3 ½ years.

From the above results, we understand that machine 'X' is preferable to machine 'Y' because the former repays the capital earlier.

N.B. The pay – back method does not consider the earnings of the post pay – back period. For and investment of Rs.25,000, Machine 'X' gives total earnings of

Rs.42, 500. there is a post pay – back profitability to the extent of

Rs.17,500 (i.e., 42,500 minus Rs.25,000).

Merits of Pay Back Period method

a. This is simple for calculations and also easy for understanding.
b. This shows how soon we get back our investment from out of the earnings.
c. Since this method considers only the pay – back or recovery period of the project and not the whole working life of the asset, the estimates are reliable and the results may be comparatively more accurate.
d. This method is preferred on the ground that return beyond ·ur or five years are so uncertain as to disregard them altogether in a planning decision.
e. This is commonly used in concerns which are not commanding sufficient cash always, they are eager to get back their cash invested in capital expenditure projects.

f. Where liquidity of the concern is of primary importance this method is recommended because it lays great emphasis on the quick return of capital.

g. It guarantees and warns the management beforehand regarding the possible threats arising from the fear of obsolescence. Though this method is easy to use and understand, it suffers from several drawbacks.

Demerits

a. The pay – back method does not actually measure the profits earned by the projects. It only considers the recovery of the "purchase cost" and hence this approach is highly conservative. b. This method gives only an incomplete picture because it considers only the period of the time during which the project pays for itself in savings. It never considers post – pay fact profitability.

c. The chief concern of this method is with the conversion of capital expenditure (investment) into cash. But this is not the criterion to evaluate projects with a long working life because such long gestation projects may yield negligible amounts in the initial stage but steadily augment its earnings over the period of its economic life in which case the pay – back period may be longer but with higher rate of return.

d. This method also offers enormous scope for manipulation of the figures; e.g., the economic life of the machine or investment can be altered so as to influence the final outcome to their favour.

Despite its weaknesses, pay – back method is popular in American industries for selecting investment proposals. A recent survey of the Machinery & Allied products institute of the U.S.A., indicated that 60 percent of the surveyed firms used pay – back method for analyzing alternative investments.

Additional Calculation in the Payback Method.

Illustration : 2

A B C company considers the mechanization of the particular process now carried on by labour. Two models are available. The following estimates are made by experts.

PROFITABILITY STATEMENT:

		MACHINE X	MACHINE Y	
Life		5 years		6 years
Cost	Rs.	20,000		30,000
Income p.a				
Annual Savings				
In wages	10,000		12,000	
In scrap	1,000	11,000	1,300	13,300
Less Additional Expenses p.a :				
Indirect materials	700		800	
Addl.Overheads	2,300	3,000	2,500	3,300
Profit (before depreciation)		8,000		10,000

Machine Cost 20,000 30,000

Pay – Back period = $\dfrac{\text{Machine Cost}}{\text{Savings p.a}} = \dfrac{20,000}{8,000} : \dfrac{30,000}{10,000}$

= 2 ½ years : 3 years

* The amount of savings per annum is uniform in this illustration. However the annual savings or earnings may very from year to year. In such case, this formula cannot be used. The period upto which the earnings are equal to investment must be calculated.

From the above statement, it is obvious that investment in machine X is recovered sooner than that in machine Y (i.e. the pay back period for machine X is less than the one for machine Y). Therefore, from this point of view (i.e.speed of recovery).machine X is preferable.

6.3.2. Average Rate of Return Method

(Accounting Rate of Return Method)

This method is nothing but an extension of the Pay – Back Method.. Under this method, an attempt is made to calculate the profits of a particular project earned over its whole working life.

The Average Rate of Return Method consists of adding all the earnings after depreciation and dividing them by the project's economic life. When this figure of average annual net profit is obtained, it is divided by average investment. Average investment on a project is the simple arithmetic mean of the values of asst at the beginning and at the end of the useful life of the asset which is always zero at the latter point of time. So, the average investment in a project is always one – half of the original investment. Though, sometimes, original investment is used, average investment is more logical.

Formula

$$\text{Average Investment} = \frac{\text{Investment in the beginning} + \text{Investment at the end}}{2}$$

$$\text{Average Rate of Return} = \frac{\text{Average Annual Net Profit}}{\text{Average Investment}}$$

'Depreciation charged under Straight line Method reduced the book value of the asset at the end of its working life. Residual value, if any also must be taken into account.

Thus the average rate of return method is an accounting method which represents the ratio of average annual profits after depreciation and tax to the average investment in the project. A rate of return is fixed keeping in view the cost of capital of the business forall capital investment projects, and projects which do not give the desired minimum rate of return are rejected. Acceptable projects are then ranked according to their respective rates of return are rejected. Acceptable projects are then ranked according to their respective rates of return.

Illustration : 3

Calculate the average return for projects 'X' and 'Y' from the following:

If the required rate of return is 12%, which project should be undertaken?

Solution:

Since the rate of return for both the projects is higher than the required rate of return of 12% both the projects will be undertaken provided that the two projects

are mutually exclusive and that enough financial resources are available. However, if the two projects are mutually exclusive or enough financial resources are not available then project 'X' will be preferred, since, the rate of return on Project 'X' is higher than the rate on Project 'Y'.

Merits of the Average Rate of Return Method

a. This method is considered to be superior to the pay – back method, i.e., unlike the earlier method, this considers the earnings of the whole working life of the project.
b. This really attempts to find out the profitability of the investment project i.e , in the pay – back method, we are concerned only with the recovery of the original investment; but this method embodied the concept of 'net earnings' after allowing for depreciation as it is of vital importance in the appraisal of a proposal.
c. When two alternative projects are available, this technique functions as a yardstick for comparing the relative profitability.
d. This technique is also easy to understand and simple to calculate.

In the option of some people, it is probably the most satisfactory method.

Demerits

If suffers from serious drawbacks.

a. As stated earlier, the most severe shortcoming is that this method ignores the time element of the earning. Therefore, it may prove, sometimes, to be unreliable or inaccurate.
b. Another demerit of this method is that not all the accounts agree with the usage of the concept of average investment. There is also the difference of opinion about the use of original investment for calculating the rate of return as given below.

$$X = \frac{1,500}{20,000} X 100 = 7.5\%$$

$$Y = \frac{2,000}{30,000} X 100 = 6.6\%$$

c. The sum total of the earnings of the entire working life of the asset is averaged and a common rate of return is calculated. But in practice, we do not get this average return uniformly every year. So this method ignores. as it is argued, the fact that profits accure at an uneven rate. As the method takes into account earnings after depreciation, it is grossly in error because it is only the cash flows, occurring subsequent to the sinking of funds in investment, that are relevant for the decision making purpose especially in respect of investment decisions which are forward looking in their nature.

d. Another problem with the method is regarding a reasonable rate of return on investments. Some stipulate a minimum rate so that if investment do not show this rate they are summarily excluded from considerations.

DISCOUNTED CASH FLOW TECHNIQUES

Investments are made in anticipation of returns. Funds will be invested in a project and will not then be available for other uses. This will be followed by a period during which funds will be gradually released from the project through the earnings. Each of these will go through a cycle of events. As such time is always crucial for the investor, sit that a sum received today is worth more than the sum to be received tomorrow. Therefore, it is important to consider the timing of returns on investments. The presence of time as a factor in investment is fundamental, rather than incidental for the purpose of valuating investments. In fact, time is the dimension through which the two monetary variables involved in investments must be related. These two variables are:

1. The capital outlays and
2. The subsequent receipts

Discounted Cash Flow Techniques consider the net cash flow as representing the recovery of original investment plus a return on capital invested. In the decision making process of any organization D.C.F has an important role to play. It enables the management to make rational decisions and to quantify the possible results of their decision in such a way that the profitability of different investment proposals can be compared directly.

Discounted cash flow method for evaluating capital expenditure proposals are of two types. They are

1. Net Present Value Method; and

2. profitab.ıty index method
3. Internal Rate of Return Method

6.3.3 NetPresent value Method [N P V Method or Net Gain Method]

This method is based upon the concept that a rupee received now will become Rs.1.10 in one year's time is the same as saying that Rs.110 receivable in one year's time has present value of Rs.100/- instead of looking forward from the present time to a time in the future, weare merely taking a future time and relating it back to the present. Under this method, we calculate the present values of the future earnings spread over a umber of years either evenly or unevenly. Then the sum total of these discounted earnings will be compared with the actual investment to find out the surplus (or otherwise). But the problem is what should be the discounting rate at which the earnings are brought down to the present values? Normally, the management will first select a minimum acceptable rate of return on investment. This rate is known as the cut – off rate. So, the project must given a return at least at this rate; otherwise it will not be accepted. Even the selection of this cut – off rate is difficult for the management. It cannot arbitrarily fix a rate. This rate is based on the average cost of capital which should be adjusted discounted to present value using the required rate of return. According to this criterion, the project is accepted if the present value of cash inflows exceeds the present value of cash outflows.

In order to compute the Net Present Value, we must know

a. The various cash inflows & outflows over the effective life of the asset and
b. THE appropriate discount rate at which cash flows are to be discounted to their present value.

Given the discount rate, the present value of cash inflows and outflows can be easily computed with the help of "Present Value Tables" (See Table at the end of this unit) by applying the appropriate discount factors to various cash flow items.

The Net Present Value Method is superior to other methods so far discussed as it takes into account both the magnitude and the timing of cash flows over the effective life of the asset. It reduces the different capital projects to a common denominator of the present worth of successive returns from the projects. According to this method, the capital project which has quick earnings

and gives the returns during early years is considered better than the capital project with the same total returns but with longer gestation periods.

However, it is difficult to use and understand for an ordinary businessman. Further it is nor possible to have a uniform rate of discount or rate of interest for application during the long service period of a capital project.

Illustration: 4

Calculate the Net Present Values of Machine 'X' and Machine 'Y' from the following data:

The Management determines 10% as the cut – off rate over the proposed investment project, Discount factors at this rate are given below.

Solution:

The N.P.V.(Net Present Value) of project 'X' is Rs.4,227 and that of project 'Y' is Rs.4,728. Since the net cash inflows exceed the net cash outflows for both the projects, both the projects acceptable.

6.3.4.Profitability Index Method

When the two projects are mutually exclusive so that only one project can be undertaken, the N.P.V.fails to establish which is a better project, since N.P.V.is expressed in absolute rather than in relative terms for making a comparison between the two projects we will have to calculate the profitability index.

$$\text{Profitability index} = \frac{\text{Present value of cash inflows}}{\text{Present value of cash outflows}}$$

	Machine 'X'	Machine 'Y'
=	$\frac{24,227}{20,000}$	$\frac{34,728}{30,000}$
=	1.211	1.157

Irrespective of the fact that the Net Present value of Machine 'Y' is greater than that of Machine 'X' Machine 'Y', is better than Machine 'y' since profitability index of Machine 'x' is greater than the profitability index of machine.

6.3.5 Internal Rate of Return Method (Time Adjusted Rate of Return or Project Rate of Return).

This method is a slight variant of present value criterion. This is used to analyse cash flows when the approximate cost of capital is not pre – determined, so we do not know the appropriate discount rate for discounting cash flows to their present value. If the appropriate discount rate is not give, we are not in a position to use the present value criterion.

The aim of this method is to find out a percentage rate of discount that will reduce all future cash inflows to the same value as the cash invested in the project. The higher the percentage rate of discounting that is used, the lower will be the present value of the cash flows. The lower the percentage used, the higher will be the sum of the present values. By a process of trial and error, a percentage rate can be ascertained that will equate the present value of the future cash flows from the project with the value of the cash investment. When this rate is found, it will be the rate of return earned o 2 ie funds invested in the projects.

This method enjoys several advantages; firstly there is no need for specifying a required rate of return. Secondary, it takes into account the magnitude as well as timing of cash inflows and outflows over the total effective life of the asset. Thirdly, since, it is a relative measures, it allows ranking of investments according to their internal return. It is useful, when the cost of investment and the annual cash inflows are known while unknown rate of return is to be calculated. However, it usually involves a trial and error procedure using present value table. When the cash flow is an uneven series, the task is even more difficult, and for computing the external rate of return, we have to resort to trial and error. Because of this the system is described as Trial & Error Method.

Illustration: 5

Project investment	-	Rs.3000
Effective Life	-	2 Years

Check your progress

1. State True or False

a) The Internal Rate of Return and Net Present Value are synonymous.

b) Cash flows from a project can be estimated accurately

c) Cash flows from a project can be worked out only on the basis of certain probabilities.

d) The inflation and deflation factors need not be taken for cash flows

e) Internal Rate of Return is a discounted cash flow method.

Anticipated earnings per year Rs.1.000

Calculate the suitable rate of return.

Solution:

Trial and Error method

Under this method, the earnings are discounted at various until a rate is found that would equate the present value of the earnings to the amount of the investment.

From the above Table . it can be first tried the rate of 12%. But this rate is too low and the present value is higher than the investment. Then we tried the rate of 15%, ir is also low. Then we tried the rate of 20%. At this rate, the present value is almost equal to the investment. Hence the internal rate of return is 20%.

If the earnings are equal for all years, there is a short cut method for obtaining the internal rate of return. This Method is as follows.

1. The investment should be divided by the annual earnings

   $\frac{\text{Investment}}{\text{Earnings}}$ By coincidence, this is the pay back period.

2. Look at Table B and pick out line for the number of years you will receive the earnings.
3. Move across this line until you find a figure nearly equal to the amount calculated in step.1. The rate indicated by this column is the internal rate of return.

In the illustration 5, Investment is Rs.3,000 and annual earnings is Rs.1000 So, 3,000/1000 = 3.

Looking at table moving across the five year line you can see that 2,990 is the closest to 3. This is about 20% column of Table, consequently, the internal rate of return is about 20%. If the cash flows are uneven, the only way to determine the rate of return is by trial and error.

Illustration: 6

Calculate the Internal Rates of Return for projects. A and B from the following data.

Solution :

Project A

There is an annuity of Rs.6,000 per year for project A.So, for calculating the internal rate of return we will use the annuity Table (See Table).

The proportion of Annuity of Rs.6,000 and initial investment of Rs.15,000 is 6,000 : 15,000 or 1:2.5.So, in the Annuity Table we will need the discount rate that will reduce an annuity of Rs.6000 for 4 years to a present value factor 2.5 A perusal of the Table shows that 2.5 factor lies between the 21% and 22% discount rates.

The approximate internal rate between 21% and 22% shall be determined by extrapolation as under:

$$\text{Internal Rate of return} = 21 + \frac{15{,}242 \text{ minus } 15{,}000}{15{,}242 \text{ minus } 14{,}961}$$

$$= 21 + \frac{242}{281}$$

$$= 21.89\%$$

Project B

For project 'B' there is a lump sum of Rs.30,000 that will be received after the end of 4th year. So, for calculation the internal rate of return, we will use the table that gives the present value of a rupee due at the end of 'n' year. The proportion between the lump sum cash inflow and the initial investment is 30,000 : 15,000 or 1:0.5. So in the table we will read the discount rate that will reduce at rupee receivable after the end of 4th year to a present value factor of 0.5. a perusal of the 'Table – 1' shows at 05. Factor lies between 18% and 19% discount rates.

The approximate internal rate between 18% and 19% shall be determined by extrapolation as under;

Lump Sum	Discount Rate	Discount Factor	Present Value
30,000	18%	.4986	15471
	19%		14958
			513

Internal Rate of Return $= 18 + \frac{15{,}471 \text{ Minus } 15{,}000}{15{,}471 \text{ Minus } 14{,}958}$

$= 18 + \frac{471}{513}$

$= 18.92\%$

Illustration: 7

Project Investment Rs.21, 600

Earnings before depreciation Rs.7,000 p.a. for 3 years and Rs.9,000

For the last 3 years.

Depreciation Rs.3,600 p.a

Calculate the suitable Rate of Return.

Solution

AVERAGE RATE OF RETURN

					Rs.
Total Investment					21,600
Average Investment		21,600	÷ 2	=	
10,800					
Total Earnings					48,000
Average Annual Earnings		48,000	÷ 6	=	8,000
Less: Annual Depreciation					3,600
					4,400

Average Rate of Return $= \frac{\text{Average Annual Net Profit}}{\text{Average Investment}}$

$= \frac{4{,}400}{10{,}800} \times 100$

$= 40.7\%$

Discounted Rate of Return (Trial & Error Method)

Note: The average rate of return for the project is 40.7%. the DCF rate of return will always be lower than the average rate, consult Table A. We first tried the rate of 30%. But this rate is too heavy the percentage used, the higher will be sum of the present value and vice versa. So we take a much lower rate of 29% which discounts the cash flows nearer to the amount of investment. So we finally try a rate next to the second and this rate 27% approximately equates both earnings and expenditure. Obviously, the next rate (26%) need not be tried at all. The DCF rate for this project is 27%.

Suitable Rate of Return = 27%

NET PRESENT VALUE METHOD Vs. INTERNAL RATE OF RETURN METHOD

There is a widespread impression that Present Value Method and Internal Rate of Return Method represent one and the same thing and since, they are series of the same genesis i.e., Discounted Cash Flow Technique.

Perhaps, both these methods evaluate capital investment proposals. They are based on the concept that money has a time value. But they approach the problem from different point of view and answer differently thereby indicating certain fundamental differences between them.

First, the present value method treats cost of capital at a known factor while the internal rate of return method treats it as an unknown factor.

Secondly, the internal rate of return method seeks to find out the maximum rate of interest at which funds invested in any given project could be repaid with earnings generated by that project while the present value method asks what amount can be invested in a given project so that its anticipated earnings will exactly suffice to repay this amount of interest astet the market rate.

Thirdly, the present value method is preferred to the internal rate method because it explicitly recognizes the availability of market for funds and assumes that business will use this market rationally to exchange their earnings. The internal rate method does not recognize the existence of such capital market and, had it been doing this, would be equivalent to the present value method.

Illustration; 8

Alagu Electronics Ltd., is considering an investment proposal. There are two mutually exclusive projects A and B for Rs.50, 000 each for comparing the proposals, a discount rate of 10% is to be used. Earnings after taxation are expected to be as follows:

CASH FLOW

Indicate which proposal would be a more profitable investment under the various methods of ranking investment proposals.

Solution:

II. NET PRESENT VALUE METHOD:

PROJECT 'A'			PROJECT 'B'			
	VALUE Rs.	DISCOUNT FACTOR AT 10%	PRESENT VALUE OF CASH FLOW Rs	VAULE	DISCOUNT FACTOR AT 10%	PRESENT VALUE OF CASH FLOW Rs.
Cash outflows	**50,000**	**1**	**50,000** **50,000**	**50,000**		**50,000** **50,000**
CASH FLOW YEAR						
1	15,000	.909	13,635	5.000	.909	4,545
2	20.000	.826	16,520	15,000	.826	12,390
3	25.000	.751	18,775	20,000	.751	15,020
4	15.000	.683	10,245	30,000	.683	20,490
5	10.000	.621	6,210	20,000	.621	12,420
			68,385			64,865
			15,385			14,865

"" Project 'A' is preferable.

CONCLUSION:

Thus Project 'A' would be preferred under Pay Back Method and Net Present Value Method while Project 'B' will be preferred according to Average

Rate of Return Method. This can be clearly explained. As project 'A' is able to recoup its cost earlier than Project 'B', it gives a good return in the early part of its life though the total earnings from project 'A' are less than project 'B'. Alagu Electronic Ltd is advised to go ahead with Project 'A'.

Illustration: 9

Suri Co. Ltd is considering the purchase of a machine which will have working life of 5 years. The machine is expected to earn Rs.10,000 per annum before the deduction of tax. The company considers an yield of 15 per cent necessary, if investment is made in the project. How much could be spent in purchasing the machine.

Solution :

Suri Co., Ltd can afford to spend approximately Rs.33,500 on the machine in order to earn an income of Rs.10,000 p.a., for next five years.

Illustration: 10

An investment of Rs.60,000 was made in a capital project two years ago. Following estimates were made at the time of investment.

1. The effective life of the asset to be 5 years
2. The scrap value at the end of 5th year to be Rs.2,000
3. The cash inflows for 5 years to be as under :

Year	Rs.
1	30,000
2	25,000
3	20,000
4	15,000
5	10,000

4. The required rate of return to be 10%

However, the past two years results have not been promising. The net cash flows for first two years have been only Rs.30,000 and Rs.25,000 respectively. In view of the past two years results the cash inflows for the remaining three years are expected to be only Rs.12,000 ; Rs.9,000 and Rs.4,000 respectively. However the investment has a present abandonment value of Rs.24, 000. Would you advise the management for abandoning the investment.

Check your progress

2. Fill in the blanks

a) Depreciation is included in ____________ method.

b) NPV method depends upon ____________ rate.

c) A project with ____________ IRR will be selected

d) NPV will be ____________ at the point of IRR.

e) Present value of cash inflows divided by Present Value of out flows is ____________.

Solution: The present value of the expected cash flows the remaining three years is Rs.22, 848 calculated as under:

Since the investment value is greater than the net present value of the expected future cash inflows, the management is advised to abandon the investment for Rs.24, 000.

Establishing Capital Priorities

It is essential to establish a system of priorities when the available capital is limited, so that the best use is made of it. The management Accountant will establish what he considers to be the most important items to be developed. Accordingly he will make recommendations to management.

The following is a list of such priorities:-

a. **Projects already in hand:** They refer to the projects which are incomplete but require additional expenditure for completion. They will receive normally top priority since they are in midstream.

b. **Projects necessiated by law:** They refer to the projects which are necessary to comply with certain legal requirements. Expenditure is necessary since it cannot be avoided.

c. **Projects to maintain capacity:** These are meant to keep the productive capacity of the business intact (e.g) expenditure on the replacement of a machine.

d. **Projects to increase earnings:** These are undertaken to reduce costs or to increase sales of the existing products and therefore naturally looked upon with favour.

e. **Projects to develop new projects:** They refer to schemes which are required improve the profitability of business.

Cost of financing a project

In making investment decisions, it is appropriate to have in view the cost of financing project. This is known as the cost of capital.

Common sense tells us that it would be uneconomical for an individual to borrow money for investment purposes, if he could not invest these funds at the higher rate. Thus, in selecting from among potential investments, a company

should accept only those proposals whose accepted return would at least exceed the cost of capital to the film. Cost of capacity places the minimum level of profit at a point determined by what it costs the company to raise money in the market.

The concept of capital has assumed a role of growing significance as a yardstick by which the desirability of projects is determines. The consequence of this is that time related rates of return began to replace less sophisticated accounting approaches in the evaluation of the investment.

The use of Net Present Value Method for capital expenditure decision requires the use of a desired minimum rate of return. There are two ways in which minimum rate may be established.

1. To use a rate reflective of operating performance in the company itself or the industry in which it is associated.
2. To base the rate on the company's cost of capital.

   Management may record its own operating experience as a satisfactory standard.

if industry's experience is better. The management may decide about this higher level of goal – setting purposes. Sometimes, the management may wish to set "desired" rate for cut off purpose which is independent of either.

The company's cost of capital' is a dynamic concept which is affected by its current structure, its financing plants for the future and changes in its rate of earnings. One method of determining company's cost of capital is the weighted average of all costs of capital.

Under these circumstances, the Management would reject capital expenditure proposals promising less than the company's cost of capital. The cost of capital constitutes the minimum acceptance criterion for new investments as capital projects. Returns below this cut – off rate dilute shareholder's equity.

6.4 KEY TERMS

• **Accounting Rate of Return:** The return computed on the basis of matching net accounting income with the investment required for a project.

• **Capital Budgeting:** The decision making process concerned with the deployment of available capital for the purpose of maximizing the long – term profitability of the firm.

• **Cut - off point:** The dividing line between the acceptable and non – acceptable proposals. It may be in terms of a period or a rate. In the former case it is termed as 'Cut – off Period".

• **Capital Rationing:** The process of allocating the funds to most desirable projects due to limitations on the availability of financing.

• **Discounted Cash Flow Method:** A method of evaluation by which the future cash flows from a project are discounted to current levels by the application of a discount rate with the objective of reducing all cash flows to a common denomination for making comparison.

• **Internal Rate of Return (IRR):** It is the rate of return at which the present value of the future cash inflows is equal to the present value of the future cash outflows. At this rate, the *NPV* is zero.

• **Net Present Value (*NPV*) Method:** The method under which future cash flows are discounted to its current value at a given rate for identifying the relative from a project.

• **Pay – back Period:** The length of the time needed to regain the original investment.

• **Profitability Index:** The ration of the total present value of future cash inflows with the total present value of future cash outflows. It is also known as excess present value index or benefits /costs ratio.

6.5 SUMMARY

Every finance manager is concerned with investment decisions. It is seen in this chapter that the determination of the amount to be invested in a long term invides various issues ruch an cort of capital, sources of finance, term of investment, method of estimating, method of appraising, capital structure, eiadity. advency, marketing etc.

A wrong decision will have its impact on the business seriously. It will be very difficult to withdraw from the decision also.

6.6 ANSWERS TO CHECK YOUR PROGRESS

1. a) False   1 b) False   1. c) True   1. d) False   1. e) True

2. a) ARR   b) Cut off   c) High

d) Zero   e) Profitability Index

6.7 QUESTIONS/EXERCISES

1. What do you mean by Capital Budgeting? Explain its objectives and limitations.
2. Write short notes on:
   a) Capital Expenditure control
   b) Investment Plan
3. Discuss the following two methods and explain the salient features there of;
   a) Pay – back Method
   b) Average Rate of Return Method
4. What is Pay – Back period? Discuss the relative advantages and disadvantages of Payback Method..
5. Examine the proposition – Discounted Cash Flow method for the appraisal of long term investment contributes to the investment analysis what the pay back method and the return on capital employed method individually cannot. .
6. Give a comparative description of any three methods commonly used for ranking long term investment proposals.
7. Calculate the Average Rate of Return for projects 'A' and 'B' from the following:

APPENDIX

TABLE – 1

PRESENT VALUE OF ONE RUPEE DUE AT THE END OF n YEARS @ %

N	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	n
01	0.90090	0.89286	0.88496	0.87719	0.86957	0.86207	0.85470	0.84746	0.84034	0.83333	01
02	.81162	.79179	.78315	.76947	.75614	.74316	.73051	.71818	.70616	.69444	02
03	.73116	.71178	.69305	.67497	.65752	.64066	.62437	.60863	.59342	.57870	03
04	.65873	.63552	.61332	.59208	.57175	.55229	.53365	.51579	.49867	.48225	04
05	.59345	.56743	.54276	.51937	.49718	.47611	.45611	.43711	.41905	.40188	05
06	.53464	.50663	.48032	.45559	.43233	.41044	.38984	.37043	.35214	.33490	06
07	.48166	.45235	.42506	.39964	.37594	.35383	.33320	.31392	.29592	.27908	07
08	.43393	.40388	.37616	.35056	.32690	.30503	.28478	.62204	.24867	.23257	08
09	.39092	.36061	.33288	.30751	.28426	.26295	.24340	.22546	.20897	.19381	09
10	.35218	.32197	.29459	.26974	.24718	.22668	.20804	.19106	.17560	.16151	10
11	.31728	.28748	.26070	.23662	.21494	.19542	.17781	.16192	.14756	.13459	11
12	.28584	.25667	.23071	.20756	.18691	.16846	.15197	.13722	.12400	.11216	12
13	.25751	.22917	.20416	.18207	.16253	.14523	.12989	.11629	.10420	.09346	13
14	.23199	.20462	.18068	.15971	.14133	.12520	.11102	.09855	.08757	.07789	14
15	.20900	.18270	.15989	.14010	.12289	.10793	.09489	.08352	.07359	.06491	15

16	.18829	.16312	.14150	.12289	.10686	.09304	.08110	.07078	.06184	.05409	16
17	.16963	.14564	.12522	.10780	.09293	.08021	.06932	.05998	.05196	.04507	17
18	.15282	.13004	.11081	.09456	.08080	.06914	.05925	.05083	.04367	.03756	18
19	.13678	.11611	.09806	.08295	.07026	.06961	.05064	.04308	.03669	.03130	19
20	.12403	.10367	.08678	.07276	.06110	.05139	.04328	.03651	.03084	.02608	20
21	.11174	.09256	.07680	.06383	.05313	.04330	.03699	.03094	.02591	.02174	21
22	.10067	.08264	.06796	.05599	.04620	.03819	.03162	.02622	.02178	.01811	22
23	.09069	.07379	.06014	.04911	.04017	.03292	.02702	.02222	.01830	.01509	23
24	.08170	.06588	.05322	.04308	.03493	.02838	.02310	.01883	.01538	.01253	24
25	.07361	.05882	.04710	.03779	.03038	.02447	.01974	.01596	.01292	.01048	25

UNIT 7 COST OF CAPITAL

Structure

7.0 Introduction
7.1 Unit objectives
7.2 Cost of capital and its computation.
7.3 Illustrations
7.4 Key terms
7.5 Summary
7.6 Answers to check your progress
7.7 Questions / Exercises

7.0 INTRODUCTION

The financing decision relates to the composition of relative proportion of various sources of finance. The financial management weights the merits and demerits of different sources of finance while taking the financing decision. A business can be financed from either the shareholders funds or borrowings from outside agencies. The shareholders funds include equity share capital, preference share capital and the accumulated profits whereas borrowings form outsiders include borrowed funds like debentures and loans from financial institutions. The borrowed funds have to be paid back with interest and some amount of risk in involved if the principal and interest is not paid. Equity has no fixed commitment regarding payment of dividends or principal amount and therefore, no risk is involved. It is the decision of the business to decide the ratio of borrowed funds and owned funds. However, most of the companies use a combination of both the shareholders funds or borrowed funds, each type of fund carries a cost. Borrowed funds involve interest payment whereas equities, as such do not have any fixed obligation but definitely they involve a cost. The cost of equity is the minimum return the shareholders would have received if they had invested elsewhere. Both types of funds incur cost and this is the cost of capital to the company. This means, cost of capital is the minimum return expected by the company. The financing decision is an important managerial decision. It influences the shareholder's return and risk. As a result, the market value of the share may be affected by the financing decision.

7.1 UNIT OBJECTIVES

- What is cost of capital?

- How to measure the cost of each component of capital?
- What is weighted average cost of capital (WACC) and marginal cost of capital?
- How cost of capital is important in financial management?

7.2 COST OF CAPITAL AND ITS COMPUTATION

The term cost of capital refers to the price that a company has to pay in order to have use of capita. For investment decisions, it is important that a company must have some idea of it cost of capital.

Companies obtain the capital they require from a number of sources and the cost of capital will vary depending upon its source. The following are the major sources of capital.

A. Debentures

B. Preference Shares

C. Equity Shares

D. Retained Earnings

E. Other sources such as credit granted by suppliers and bank overdraft.

The world in which we live, however, is not tax free and also may contain non – negligible transaction – cost for the purchase or sale of securities The basic thing to understand at this stage is that all costs of individual sources of finance are calculated on *"after tax"* basis so that, they may be matched with the net cash benefits after taxes from the proposed capital expenditure projects.

A. Debentures

Debentures are fixed interest loans, interest on debentures must be paid irrespective of the profit of the company. The cost of debentures to the company is the rate of interest it must pay on debentures plus service charges less company tax rates. Hence, the actual cost of debentures will be calculated as

Kd = Int – (R X T)

Where

Kd	=	Cost of Debentures
R	=	Rate of Interest
T	=	Tax – rate

(e.g) debentures are issued at 16% and current company taxation rate is 50%. Then, the cost of capital for the source of fund is

Kd = Int – (R X T)

$$= 16 - \frac{16 \times 50}{100}$$

= 16 – 8

= 8%

B. Preference shares

Preference shares carry a fixed rate of dividend and are given priority over equity

$$Kp = \frac{D}{S} \times 100$$

shares in receiving dividend. The cost of preference shares is the dividend rate that the company must pay on its preference shares. If preference shares are issued at Rs.120 and carries a dividend rate of 12% then the actual cost of capital will be reduced.

Where

Kp	=	Cost of Preference shares
D	=	Dividend Rate per annum
S	=	Net proceeds of shares

$$K = \frac{D}{S} \times 100$$

$$= \frac{12}{120} \times 100$$

= 10%

C. Equity shares

Equity shareholders are entitled to the net earnings of the company after deducting debenture interest, loan interest and dividend on preference shares. The return of the equity shareholders consists of two parts.

i) Cash Dividend out of Net Profit

ii) Profit retained in the business

(e.g) A company with 8, 00,000 equity shares having a current market volume of rs.100 earns an annual after tax profit of Rs.96, 000. Hence the current earnings per share work out to $\frac{96,000}{8,00,000}$ x 100 = Rs.12. if this company wished to raise Rs.2 lakhs for a new project, and the net proceeds per share after deduction of issue costs are Rs.80, then it would need to issue $\frac{2,00,000}{80}$ = 2,500 equity shares. Existing equity shareholders are worst affected issue. Then the new project must add at least 2,500 x Rs.12 = 30,000 to net annual profit.

This represents the minimum return on the investment of $\frac{30,000}{2,00,000}$ x 100 = 15%

The actual cost of equity share will be reduced.

$$Ke = \frac{D}{P} + g$$

Where

Ke	=	Cost of Equity Shares
D	=	Current Dividend Rate
P	=	Current Market Price of Equity Shares
G	=	Expected Annual Rate of Growth of Dividend

D. Retained earnings

Retained Earnings or profits do not involve any issue cost. It is often evaluated in terms of opportunity cost. The cost of retained earnings may be regarded as the rate which equity shareholders could earn on these funds if they had made them available to invest elsewhere.

(e.g) A company distributes all of its net profits to its shareholders and sells enough equity shares to the same shareholders. By doing this, the company incurs two years of costs which could be avoided. First, equity shareholders have to pay income taxes on the dividends received. Second, the company has to pay floatation cost for the new issue of shares. Therefore, the cost of retained earnings will be reduced.

$$Kre = \frac{(1 - t - f)E}{P}$$

Where

Kre	=	Cost of Retained Earnings
t	=	Marginal income tax – Rate of Equity Shareholders
f	=	flotation Cost
E	=	Anticipated Earnings
P	=	Price of Equity Share

Other capital sources

Other capital sources include credit granted by suppliers and bank over draft. Bank overdraft carries a specific interest cost. When the company gets Equipments from suppliers on a credit basis it foregoes cash discounts offered by them. The cash discount forgone is the actual cost of capital obtained by credit granted by supplier.

Weighted Average Cost of Capital

Since companies use more than one source of capital, it would be difficult as well as arbitrary to associate particular investment projects with particular source of finance. Therefore, companies tend to work in terms of their overall cost of capital which will be weighted average of individual sources of capital.

Having determined the cost of each individual source of capital the next step is to extract from an overall cost which can be applied to any project irrespective of the source of finance. That is, the overall cost of capital is the 'Weighted Average Cost of capital'. The following table illustrates the calculation of cost of capital of the hypothetical company.

Weighted Average Cost of Capital = **Kw = Σ WK / Σ W**
= 1100 / 100
= 11%

11% is the minimum rate of return which the above hypothetical company requires as a condition for undertaking an investment

Now, what is cost of capital?

"it is the minimum rate of return which a company requires as a condition for undertaking an investment".

"it is the weighted average cost of the constituent parts of capital employed in the company".

Thus, the concept of cost of capital can be considered from the overall cost of capital point of view and the cost of individual sources of finance. The overall cost is the weighted average cost of all sources of finance which are employed by the company. It is clear, therefore, that even to find out 'overall cost', the cost of individual source of finance need be calculated.

Difficulties encountered

The following are the complications that stand in the way of measuring cost of capital.

I. The capital structure of the company – that is, ratio among equity shares, preference shares and debentures may affect the cost of capital.

II. Some writers suggest that the cost of capital should be defined as *Earnings Price Ratio'* When the company has an optimum capital structure (at which debentures = owner's share). But determination of future earnings is also highly difficult.

III. The Company's policy on retained earnings may influence cost of capital.

IV. Certain subjective considerations have an influence on the cost of capital. Some companies have an aversion to debt. Some others favour 'trading on equity.'

To sum up, the cost of capital as perceived by a company's management can depend on a very large number of considerations such as the capital structure of the company and individual income tax rates, the growth characteristics, the interest rate in money markets, the general state of the stock market shareholders, expectations and so forth. Under these circumstances, it is hardly surprising that, most companies adopt a more or less arbitrary rule of thumb about the cost they will attach to their use of capital and employ it as a discount rate in present – value calculations. Typically, these rule of thumb estimate range between 10 and 20 percent for Indian companies, with exceptions usually lying above the higher, rather than below the lower figure.

As you know the capital funding of a company is made up to two components: dept and equity. Lenders and equity holders each expect a certain return on the funds or capital they have provided. The cost of capital is the expected return to equity owners (or shareholders) and to debt holders, so weighted average cost of capital tells the return that both stakeholders – equity owners and lenders – can expect. WACC, in other words, represents the investors' opportunity cost of taking on the risk of putting money into a company. Since every company has a capital structure i.e. what percentage of debt comes from retained earnings, equity shares, preference shares, and bonds, so by taking a weighted average, it can be seen how much interest the company has to pay for every rupee it borrows. This is the weighted average cost of capital.

The weighted average cost of capital for a firm is of use in two major areas: in consideration of the fire's position and in evaluation of proposed changes necessitating a change in the firm's capital. Thus, a weighted average technique may be used in a quasi-marginal way to evaluate a proposed investment project, such as the construction of a new building.

Thus, weighted average cost to capital is the weighted average after tax costs of the individual components of firm's capital structure. That is, the after

tax cost of each debt and equity is calculated separately and added together to a single overall cost of capital.

K0 = % D (mkt) (K1) (1-t) + (%Psmkt) Kp + (Cs mkt) Ke

Where, K0	=	Overall cost of capital
K1	=	Before tax cost to debt
1 – t	=	1 – Corporate tax rate
Kp	=	Cost of preference capital
Ke	=	Cost of equity
% Dmkt	=	% of debt in capital structure
% Psmkt	=	% of preference share in capital structure
% Cs	=	% of equity share in capital structure.

The cost of weighted average method is preferred because the proportions of various sources of funds in the capital structure are different. To be representative, therefore, cost of capital should take into account the relative proportions of different sources of finance.

Securities analysts employ WACC all the time when valuing and selecting investments. In discounted cash flow analysis, WACC is used as the discount rate applied to future cash flows for deriving a business's net present value. WACC can be used as a hurdle rate against which to assess return on investment capital performance. It also plays a key role in economic value added (EVA) calculations.

Investors use WACC as a tool to decide whether or not to invest. The WACC represents the minimum rate of return at which a company produces value for its investors. Let's say a company produces a return of 20% and has a WACC of 11%. By contrast, if the company's return is less than WACC, the company is shedding value, which indicated that investor should put their money elsewhere.

Therefore, WACC serves as a useful reality check for investors.

Calculation of WACC

So the WACC of this company is 7.95%.

But there are problems in determination of weighted average cost of capital. These mainly relate to computation of equity capital and the assignment of weights to the cost of specific source of financing. Assignment of weights can

be possible either on the basis of marginal weighting or historical weighting. The most serous limitation of marginal weighting is that it does not consider the long run implications of firm's current financing. The validity of the assumption of historical weighting is that choosing between the book value weights and market value weights. While the book value weights may be operationally convenient, the market value basis is theoretically more consistent, sound and a better indicator of firm's capital structure. The desirable practice is to employ market weights to compute the firm's cost of capital. This rationale rests on the fact that the cost of capital measures the cost of issuing securities – stocks as well as bonds – to finance projects, and that these securities are issued at market value, not at book value.

Illustration

Calculate the WACC using the following data by using:

(A) Book value weights

(B) Market value weights

The capital structure of the company is as under:

	Rs.
Debentures (Rs. 100 per debenture)	5, 00, 000
Preference shares (Rs. 100 per share)	5, 00, 000
Equity shares (Rs. 10 per share)	10, 00, 000

The market prices of these securities are:

Debenture	Rs. 105 per debenture
Preference	Rs. 110 per preference share
Equity	Rs. 24 each

Additional information

(1) Rs. 100 per debenture redeemable at par, 10% coupon rate, 4% floatation costs, 10 Year maturity.

(2) Rs. 100 per preference share redeemable at par, 5 % coupon rate, 2% floatation cost and 10 year maturity.

(3) Equity shares has Rs. 4 floatation cost and market price Rs. 24 per share.

The next year expected dividend is Rs. 10 with annual growth of 5%. The firm has practice of paying all earnings in the form of divided.

Corporate tax rate is 50%

Solution

Cost of equity = Ke = (10 / 20)+ .05

= .05 + .05

= .10

$$\text{Cost of debt} = \frac{10(1-.5) + (100-96)/10}{\frac{(100+96)}{2}}$$

$$= \frac{5+.4}{196} \times 2 = .055 \text{ (approx.)}$$

Cost of preference shares = Kp = [5 +(2/10)] / (198 / 2)

= 5.2 / 99 ≐ .053 (approx.)

Calculation of WACC using book value weights

Source of capital cost	Book value	Specific cost (K%)	Total
10% Debentures	5, 00, 000	.055	27, 500
5% Preference shared	5, 00, 000	.053	26, 500
Equity shares	10, 00, 000	.10	1, 00, 000

K0 = Rs. 1, 54, 000 / Rs. 20, 00, 000 = 0.077 (approx)

Calculation of WACC using market value weights

K0 = Rs. 2, 98, 025 / Rs. 34, 75, 000 = 0.08576 (approx)

Marginal Cost of Capital

The marginal cost of capital may be defined as the cost of raising an additional rupee of capital. Since the capital is raised in substantial amount in practice marginal cost is referred to as the cost incurrent in raising new funds. Marginal cost of capital is derived, when the average cost of capital is calculated using the marginal weights. The marginal weights represent the proportion of funds the firm intends to employ. Thus, the problem of choosing between the book value weights and the market value weights does not arise in the case of marginal cost of capital computation. To calculate the marginal cost of capital, the intended financing proportion should be applied as weights to marginal

Check your progress

1. State True or False

a) The cost of capital is the minimum rate of return that will maintain the value of a firm's equity shares.

b) The implicit cost is the discount rate that equates the present value of the funds received by the firm with the present value of expected cash outflows.

c) For financial decision making, relevant costs are the historical costs

d) Composite cost in inclusive of all cost of capital from all sources.

e) Marginal cost is the weighted average cost of the new funds raised by the firm.

component costs. The marginal cost of capital should, therefore, be calculated in the component costs. The marginal cost of capital should, therefore, be calculated in the composite sense. When a firm raises funds in proportional manner and the component's cost remains unchanged, there will be no difference between average cost of capital (of the total funds) and the marginal cost of capital. The component costr may remain constant up to certain level of funds raised and then start increasing with amount of funds raised. For example, the cost of debt may remain 7% (after tax) till Rs. 10 lakhs of debt is raised, between Rs. 10 lakhs and Rs. 15lakhs, the cost may be 8% and so on. Similarly, if the firm has to use the external equity when the retained profits are not sufficient, the cost of equity will be higher because of the floatation costs. When the components cost start rising, the average cost of capital will rise and the marginal cost of capital will however, rise at a faster rate.

Illustration

ABC Ltd. has the following capital structure which is considered to be optimum as on 31st March, 2006.

	Rs.
14% debentures	30, 000
11% Preference shares	10, 000
Equity (10, 000 shares)	1, 60, 000
	2, 00, 000

The company share has a market price of Rs. 23.60. Next year dividend per share is 50% of year 2006 EPS. The following is the trend of EPS for the preceding 10 years which is expected to continue in future.

Year	EPS(Rs.)	year	EPS(Rs.)
1997	1.00	2002	1.61
1998	1.10	2003	1.77
1999	1.21	2004	1.95
2000	1.33	2005	2.15
2001	1.46	2006	2.36

The company issued new debentures company 165 rate of interest and the current market price of debenture is Rs. 96.

Preference share Rs. 9.20 (with annual dividend of Rs. 1.1 per share) were also issued. The company is in 50% tax bracket.

(A) Calculate after tax:

(i) Cost of new debt

(ii) Cost of new preference shares

(iii) New equity/share (consuming new equity from retained earnings)

(B) Calculate marginal cost of capital when no new shares are issued.

(C) How much needs to be spent for capital investment before issuing new shares? 50% of the 2006 earnings are available as retained earnings for the purpose of capital investment.

(D) What will the marginal cost of capital when the funds exceeds the amount calculated in (C), assuming new equity is issued at Rs. 20 per share?

Solution

(A) (i) Cost of new debt

$$Kd = \frac{I(1-t)}{N}$$

$$= \frac{16(1-.5)}{96} = .0833$$

(ii) Cost of new preference shares

$$Kp = \frac{P}{O}$$

$$= 1.1 / 9.2 = .12$$

(iii) Cost of new equity shares

$$Ke = (D1 / P0) + G$$

$$= (1.18 / 23.60) + 0.10 = 10.10 = 0.15$$

(B) Calculation of D1

D1 = 50% of 2006 EPS = 50% of 2.36 = Rs. 1.18

(C) The company can spend the following amount:

Retained earnings = (.50) (2.36 x 10, 000)

= Rs. 11, 800

The ordinary equity is 80% of total capital

Capital investment = $\frac{\text{Rs } 11,800}{.80}$ = Rs. 14, 750

(D) If the company require fund in excess of Rs. 14, 750, it will have to Issue new shares.

The cost of new issue will be

$$Ke = \frac{Rs.\ 1.18}{20} + .10 = .159$$

The marginal cost of capital will be

7.3 ILLUTRATIONS

1. Cost of Debt capital

A firm has issued Rs.30,00,000 of debt capital @ 7% for Rs.27,00,000. the bonds are repayable within a period of 5 years (a) what is the after tax of capital for the new issue. (b) if the Bonds were existing bonds, what is the after tax cost of capital. The tax rate is 45%

Solution

$$Kd = \frac{\mathbf{(1 - t)\ R + 1 / (FV - MV)}}{1/2\ (FV+MV)}$$

Kd	=	Cost of debt capital
T	=	tax rate
R	=	Interest amount
n	=	number of years to maturity
FV	=	Face value in the security
MV	=	Market value (proceeds from the sale) or maturity value

(a) When the Bonds are issued freshly

$$Kd = \frac{(1 - 0.45)\ 2,10,000 + [1/5 \times 30,00,000 - 27,00,000]}{1/2\ (30,00,000 + 27,00,0000}$$

$$Kd = \frac{2,70,000}{28,50,000} = 9.5\%$$

(Before tax)

After tax cost of capital (9.5) (1 - .45) = 5.2%

(b) After tax cost of capital for existing debt is

Kd = (1 – t) r

t = tax rate

r = rate of interest

$$Kd = \frac{2,10,000}{3,00,000} = 7\%$$

After tax cost = (1 – 0.45) (0.07) = 3.85%

2. Cost of Preference capital

A firm sells Rs.15,00,000 worth of preference shares at the par value of Rs.500 per share with agreed dividend rate of 7 percent. Later the market value of the preference share has dropped to Rs.485 per share. The original issue yielded a net proceeds of Rs.14, 25,000. Find out

a) The effective cost of the new issue
b) The effective cost of the Preference share capital at a latter date.

Solution:

Kp = D / P

Kp = Cost of preference capital (after tax)

D = Dividends

P = Market price of preference share or Net proceeds

(a) The effective cost of the new issue is:

$$Kp = \frac{1,05,000}{14,25,000} = 7.4\%$$

Dividend is arrived at as follows.

7% preference dividend = Percentage of Dividend x Face value of the preference shares

$$= \frac{7}{100} \times 15,00,000 \qquad = Rs.1,05,000$$

b) The effective cost of preference shares at a later date:

$$Kp = \frac{D}{P}$$

Kp = Cost of Preference capital (after tax)

D = Dividend

P = Market Price

$$Kp = \frac{35}{485} = 7.2\%$$

3. Cost of Equity shares

A common share selling at a current market price of Rs.120 and paying an

average dividend of Rs.9 per share which is expected to grow at the rate of 8 percent. Find out the cost of equity shares.

Solution :

Ke = (D1 / Pe) + g

Ke = Cost of equity capital (after tax)

D1 = Dividends after the growth rate is applied

Pe = Current market price of the share

g = growth rate

$$= \frac{9\,(1.08)}{120} + 0.08 = \frac{9.72}{120} + 0.08$$

= 081+0.08 = 0.161

In terms of Percentage = 0.161 x 100 = 16%

Illustration :

A company has a current dividend rate of Rs.4 per share and EPS of Rs.10 and the actual market price of Rs.70. Find out the company's equity cost of capital.

Solution:

Ke = (D / P) + g

D = Dividend

P = Market Price

g = growth rate

In this problem the growth rate of the company is not given. It can be found out by the multiplication of retained earnings with the internal rate of return or EPS>

$$g = 0.6 \times 0.1 = 0.06$$

$$Ke = 4/70 + 0.06 = 0.117$$

In terms of percentage = 0.117 x 100

$$Ke = 11.7\%$$

5 Cost of newly issued equity shares

A firm issued Rs.100 worth shares for Rs.80 and the flotation cost per share is Rs.5. the company's EPS is Rs.5.Its current rate of dividend is Rs.2.50 growth rate is 5%. Find out the equity cost of capital.

By Earnings method

$$Ke = E/P$$

Ke = Cost of equity capital (after tax)

P = Market price or net proceeds of the issue.

E = Earnings to the shares after the growth rate.

$$Ke = (5/80\text{-}.5) = 5/75 = 6.66\%$$

By Growth method

$$Ke = \frac{D}{P} + g$$

Ke = Cost of equity capital (after tax)

P = Market Price of net proceeds of the issue.

g = growth rate

D = Current Dividend

$$Ke = \frac{250}{75} + 0.05 = 3.38\%$$

$$Ke = 3.38\%$$

Note:

Some authors include the growth rate to assess the correct rate of dividend in the Dividend model. Some authors feel that the dividend given is the current rate of dividend and so it should be adjusted for growth rate. So students are advised as follows.

a) If the average rate of dividend is given, students can apply the growth rate to find out the current dividend to be used in the formula.

Check your progress

2. Fill in the blanks

a) Cost of capital comprises premium both for business and ——— risks.

b) Cost of each component of capital is termed as ——— cost.

c) In case of ——— weights method, weights are assigned to each source of funds in proportion of financing inputs the firm intends to employ.

d) MM approach assumes that ——— markets are perfect.

e) Cost of capital serves as ——— rate for capital investment decisions.

b) If the current rate of dividend is given they can directly take the ruling dividend rate and solve the problem without applying the growth rate..

6 Weighted Average Cost of Capital

Compute the weighted average cost of capital from the following the company has the following capital structure.

	Rs.
Equity shares (2, 00,000 shares)	40, 00,000
6% Preference shares	10, 00,000
8% Debentures	30, 00,000
	80, 00,000

The company raises an additional capital through the issue of debentures for Rs.20, 00,000 by issuing 10 percent debentures. This would result in increasing the expected divided to Rs.3 and leave the growth rate unchanged, but the price of the share will fail to Rs.15 per shares. The growth rate is 7 percent.

Solution:

Cost of Equity share is

$$Ke = \frac{D1}{Po} + g = \frac{3}{15} + 0.07$$

$$= 0.20 + 0.07 = 0.27$$

Weighted average cost in percentage = 13.60%

7.4 KEY TERMS

- Average Cost of Capital: It is the weighted average cost based on cost of each component of funds employed by a firm.
- Combined Cost: It is the composite cost of capital from all sources.
- Cost of Capital: The minimum rate of return a firm must earn on its investments to maintain the market value of its equity shares.
- Explicit Cost of Capital: The discount rate that equates the present value of the funds received by the firm net of underwriting costs, with the present value of expected cash outflows.
- Future Cost of Capital: It refers to the expected cost of funds to be raised to finance a project.
- Historical Cost: It is the cost of funds which has already been incurred for financing a particular project.
- Implicit Cost of Capital: The rate of return associated with the best investment opportunity for the firm and its shareholders that will be forgone if the project presently under consideration was accepted.
- Specific Cost: It is cost of a specific source of finance.

7.5 SUMMARY

The determination of cost of capital is thus beset with a number of problems in dynamic world of today. Conditions which are present now may not remain static in future. Therefore, howsoever cost of capital is determined now, it is dependent on certain conditions or situations which are subject to change, such as the firm's internal structures and character change, changes in the conditions of capital market, the demand and supply of funds, the experience of the company with the capital structures, etc.

In practice, because of these reasons the rodents should periodically re examine the situations behind the computation of consent of capital, which is the base for determining capital budgets.

7.6 ANSWER TO CHECK YOUR PROGRESS

1	a) True	b) False	c) False
	d) True	e) True	
2.	a) financial	b) Specific	c) Marginal
	d) Capital	e) Cut off	

7.7 Questions / Exercises

1. a) What is the relevance of cost of capital in corporate investment and financing decisions?

   b) Examine the problems in determination of composite cost of capital.
2. Write short notes on:
   a) Financial Risk.
   b) Marginal Cost of Capital
3. Explain the concept of "Cost of Capital" as a device for establishing a cut off point of capital investment proposals.
4. What is meant by Cost of Capital for a firm and what relevance does it have in decision making? How is it calculated with different types of sources of capital funds? Why is the Cost of Capital most appropriately measured on an after – tax basis?
5. What is meant by cost of Capital? What are the components of Cost of Capital? What is cost of Retained Earnings? How is the cost of new equity issue determined?
6. What is a business risk and is it the same as financial risk? How does the use of financial leverage affect the financial risk?

NOTES

7. What is Modigliani -- Miller approach to the problem of Cost of Capital Structure? Under what assumptions do their conclusions hold good?
8. A company's cost of capital was 15% in 1997. According to the management this consisted of 8% due to riskless cost of money. 3% business risk premium and 4% financial risk premium. The company intends to issue new equity shares in 1998. you are required to determine the cost of equity capital in each of the following cases:
   a) in 1998 the riskless cost of money goes up by 1%. Of course. The financial and business risks remain unchanged.
   b) Besides increase in the riskless cost of money by 1%. The business risk increases by 50% on account of the company's undertaking a new line of production.
   c) A competitor of the firm has 9% riskless cost of money, 3% business risk and only 1% as financial risk since he has paid all long – term debts in 1996.

9. Mendex Ltd. Issued 10% irredeemable preference share. The nominal value of each share is Rs.100. you are required to calculate the cost of preference share capital in each of the following cases:
   a) When issued at 5% discount. And
   b) When issued at 5% premium.
10. The current market price of the shares of A Ltd. Is Rs. 95. The floatation costs are Rs.5per share. Dividend per share amounts to Rs.4.50 and is expected to grow at a rate of 7%. You are required to calculate the cost of equity share capital.
11. The Xavier Corporation, a dynamic growth firm which pays no dividends, anticipates a long – run level of future earning of Rs.7 per share. The current price of Xavier's shares is Rs.55.45. floatation costs for the sales of equity shares would average about 10% of the price of the shares. What is the cost of new equity capital to Xavier?
12. Mahendrao is a shareholder in the Central India Ltd. Although earnings for the Central have varied considerably, mahendrao has determined that the long – run average dividends for the firm have been Rs.2 per share. He expects a similar pattern to prevail in the future. Given the volatility of the Central's dividends. Mahendrao has decided that minimum rate of 20% should be earned on this share. What price would Mahendrao be willing to pay for the Central's shares?
13. ABC Ltd. Has the following capital structure:

Equity (expected dividend 12%)	Rs.10, 00,000
10% Preference	Rs. 5, 00,000
8% Loan	Rs.15, 00,000

You are required to calculate the weighted average cost of capital, assuming 50% as the rate of income tax, before and after tax.

A company maintains debt equity ratio of 40:60. The desired rate of return after tax on debt is 4% and on equity is 10%. The company is intending for

investing in a project which will cost Rs.40,000. You are required to calculate the yield annum on the project so that the market value of the equity shares remains consistent even after raising additional funds.

14. A company maintains debt equity ratio of 40:60. The desired rate of return after tax on debt is 4% and on equity is 10%. The company is intending for investing in a project which will cost Rs.40,000. You are required to calculate the yield annum on the project so that the market value of the equity shares remains consistent even after raising additional funds.

UNIT 8 CAPITAL STRUCTURE

Structure

8.0 Introduction.

8.1 Unit objectives.

8.2 Theories of capital structure.

8.3 Leverages.

8.4 EBIT – EPS – Analysis.

8.5 Key Terms.

8.6 Summary.

8.7 Answers to check your progress.

8.8 Questions / Exercises.

8.0 INTRODUCTION

A firm can finance its operations through common and preference shares, with retained earnings, or with debt. Usually a firm uses a combination of these financing instruments.

The proportion of short and long – term debt is considered when analyzing capital structure. Capital structure refers to a firm's debt- to – equity ratio, which provides insight into how risky a company is, usually a company more heavily financed by debt poses greater risk.

Firms can obtain their long-term financing from either debt or equity or some combination of debt and equity. Capital structure decisions by firms will have an effect on the expected profitability of the firm, the risks facing debt holders and shareholders, the probability of failure, the cost of capital and the market value of the firm.

8.1 UNIT OBJECTIVES

- What is capital structure?.
- What is optimal capital structure and theories relating to the value of the firm?
- Understand EBIT – EPS break even.
- Define operating and financial leverage and identify causes of both.
- Define, calculate, and interpret a firm's degree of operating, financial, and total leverage;

- Calculate a firm's operating break-even (quantity) point and break – even (sales) point; and
- Understand what is involved in determining the appropriate amount of financial leverage for a firm.

8.2 THEORIES OF CAPITAL STRUCTURE

There are four major theories explaining the relationship between capital structure. Cost of capital and value of the firm.

1. Net incomes (NI) Approach
2. Net operating income (NOI) Approach
3. Modigliani – Miller (MM) Approach and
4. Traditional Approach.

These theories are explained one by one below

8.2.1 Net income (NI) Approach

This approach has been suggested by David Durand. In his book "Costs of Dept & Equity funds for Business". According to him, a higher debt content in the capital structure (ie, high financial leverage) will result in a decline in the overall or weighted average cost of the capital. This will cause increase in the value of the film and consequently increase in the value of equity shares of the company. Reverse will happen in a converse situation.

It has three assumptions.

i. There are no corporate taxes.

ii. The cost of debt is less than cost of equity or equity capitalization rate.

iii. The debt content does not change the risk perception of the investors.

The value of the firm on the basis of NI Approach can be ascertained as follows:

$V = S + B$ Where V = Value of Firm;

S = Market value of Equity

B = Market value of Debt.

The market value of Equity can be ascertained as follows:

$S = NI/ke$ Where S = Market value of Equity.

NI = Earnings available for equity Share holders

Ke = Equity Capitalization Rate.

8.2.2 Net Operating Income (NOI) Approach:

This approach has also been suggested by David Durand. According to

this approach, the market value of the firm is not at all affected by the capital structure changes. The market value of the firm is ascertained by capitalizing the net operating income at the overall cost of capital (k) which is considered to be constant. The market value of equity is ascertained by deducting the market value of the debt from the market value of the firm.

This is based on the following assumptions.

i. The overall cost of capital (k) remains constant for all degrees of debt - equity mix or leverage.

ii. The market capitalizes the value of the firm as a whole and therefore, the split between debt and equity is not relevant.

iii. The use of debt having low cost increases the risk of equity shareholders, this results in increase in equity capitalization rate. Thus, the advantage of debt is set of exactly by increase in the equity capitalization rate.

iv. There are no corporate taxes.

Value of the Firm

By this approach, the value of a firm can be ascertained by the following equation.

$$V = \frac{EBIT}{K}$$

Where V = Value of Firm,

K = Overall cost of capital.

EBIT = Earnings before interest and tax.

Value of Equity:

The value of Equity (S) is a residual value, which is determined by deducting the total value of debt (B) from the total value of the firm. (V). Thus, the value of equity can be determined by the following equating.

$$S = V - B$$

Where S = value of equity

V = value of firm.

B = value of debt.

8.2.3 Modigliani – Miller Approach

This is similar to the Net Operating Income (BOI) approach. According to this approach, the value of a firm is independent of its capital structure. However, there is a basic difference between the two. The MM approach

supports the NOI approach providing behavioral justification for the independence of the total valuation and the cost of capital of the firm from its capital structure. The M approach maintains that the average cost of capital does not change with change in the debt weighed equity mix or capital structure of the firm. It also gives operational justifications for this and not merely states only a proposition.

Basic Propositions:

It has three basic propositions. i.e.,

i. The Overall cost of capital

ii. The cost equity (ke) is equal to capitalization rate of a pure equity stream plus a premium for the financial risk.

iii. The cut – off rate of investment purposes is completely independent of the way in which an investment is financed.

Assumptions:

This is subject to the following assumptions.

i. Capital markets are perfect.

ii. The firms can be classified into homogeneous risk classes.

iii. All investors have the same expectation of firm's net operating income (EBIT) with which to evaluate the value of any firm.

iv. The dividend pay – out ratio is 100%

v. There are no corporate taxes.

Arbitrage Process:

The "arbitrage process" is the operational justification of MM hypothesis. The impact of such action is that the market price of the securities of the two firms exactly similar in all respects except in their capital structures cannot for long remain different in different markets. Thus, arbitrage process restores equilibrium in value of securities. This is because in case of the market value of the two firms which are equal in all respects except that capital structures are not equal investors of the overvalued firm would sell their shares, borrow additional funds on personal account and invest in the undervalued firm in order to obtain the same return on smaller investment outlay. The use of debt by the investor for arbitrage is termed as 'home mode' or 'personal leverage'

8.2.4 Traditional Approach:

The traditional Approach or the intermediate approach is a [illegible]

between the two approaches. It partly contains features of both the approaches as given below.

i. The approach is similar to NI Approach to the extent that it accepts that the capital structure or leverage of the firm affects the cost of capital and its valuation.

ii. It subscribes to the NOI Approach that beyond a certain degree of leverage, the overall cost of capital increases resulting in decrease in the total value of the firm.

The essence of the Traditional Approach lies in the fact that a firm through judicious use of debt – equity mix can increase its total value and thereby reduce its overall cost of capital. This is because debt is relatively a cheaper source of funds as compared to raising money through shares because of tax advantage. However, beyond a point ,raising of funds through debt may become a financial risk and would result in a higher equity capitalization rate. Thus, up to a point, the content of debt in the capital structure will favourably affect the value of a firm and beyond that point the use of debt will adversely affect the value of firm.

8.3 LEVERAGES

A firm can make use of different sources of financing whose costs are different, These costs may be fixed in some cases or variable in some other cases. These returns on the debts also different fromthe return to the ordinary share holders. Thus a proper "financing decision" is required to deal with these returns.

The employment of an asset or source of funds for which the firm has to pay a fixed cost or fixed return may be termed as leverage. When the earnings before interest and taxes (EBIT) exceed the fixed return requirement, it is a favourable leverage and whe
n they do not, it is an unfavourable leverage.

Types of Leverage

There are two types of leverage namely

i. Operating Leverages

ii. Financial Leverages and

iii. Combined leverage

8.3.1 Operating Leverage

The earnings before interest and taxes are generally called as operating profits. Hence operating leverage is determined by the relationship between the firm's sales revenues and its earnings before interest and taxes (EBIT). The operating leverage may be defined as the firm's ability to use fixed operating costs to magnify the effects of changes in sales or its earnings before interest and taxes. Operating leverage occurs any time a firm has fixed costs. With fixed costs, the percentage change in profits accompanying a change in volume is greater than the percentage change in volume.. This occurrence is known as operating leverage.

Illustration 1

A firm sells products for Rs.100 per unit, has variable operating costs of Rs.50 per unit and fixed operating costs of Rs.50,000 per year. Show the various levels of EBIT that would result from sale of

i) 1000 units ii) 2000 units and iii) 3000 units

Solution:

If sales level of 2000 units are used as a base for comparison, the operating leverage is

illustrated as follows:

EBIT for various sales levels

	Case 2	Base	Case 1
	- 20%		+ 50%
1. Sales in units	100	2000	3000
2. Sales Revenue	Rs.1, 00,000	Rs.2, 00,000	Rs.3, 00,000
3. Less variable Operating cost	50, 000	1, 00,000	1, 50,000
4. Contribution	50, 000	1, 00,000	1, 50,000
5. Less fixed operating cost	Zero	50, 000	1, 00,000
	- 100%		+100%

It can be observed from the results that

i) Case – 1 A 50% increase in sales (from 2000 units to 3000 units) results in a 100% increase in EBIT (fro m Rs.50000 to Rs.100000).

ii) Case – 2 A 50% decrease in sales (from 2000 to 1000 units) result in a 100% decrease in EBIT (from Rs.50000 to Zero).

Check your progress

1. State True or False

a) The term 'capital structure' includes also the financial structure.

b) The optimum capital structure is obtained when the market value per equity share is the maximum.

c) Net income approach and net operating income approach are synonymous terms.

d) According to MM approach, the value of a firm is affected by the debt-equity mix.

e) The traditional approach is a mid-way approach between net income approach and net